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THE MONIST

OUTLINES OF A SYSTEM OF MORALITY BASED ON THE HARMONY OF LIFE[1]

First Part

THE MORAL POSTULATES OF THE VARIOUS PHILOSOPHICAL SCHOOLS AND THE POSTULATE OF HARMONY

WE propose in this study to summarize the fundamental features of that sysem of morals to which our studies of biological and sociological synthesis have led us, and which we long ago set ourselves to develop into an elaborate work. Since many more years of study and labor will be required for its completion, the fear that life or its forces might fail us before this task is fully finished has impelled us here to give a temporary and first rough sketch of our doctrine.

I

The Choice of a Supreme Moral Postulate is always Affective, Not Rational

To adopt a given system of morals implies, for the morally and intellectually superior man, that he render his conduct, in all circumstances, more and more coherent and conformable to a supreme and unique moral postulate, which represents the result and constitutes the expression of his entire affective substratum. This affective substratum results in its turn, in the words of Galton, from the play and the reciprocal interrelations of "nature" and "nurture;" that is to say, it issues from the development

[1] Translated from the French by Paul Crissman and Edward L. Schaub, with subsequent revisions by the author.

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of hereditary or inner tendencies under the modifying and plasmatic action of the moral surroundings in which the individual lives and of the education which he has received.

Therefore: *Subjective choice* of this supreme moral postulate, determined by the affective springs of the individual.

If, in the presence of the supreme moral postulate thus chosen, we ask any one *why* he has adopted this postulate rather than another, he will be able to reply only by saying in substance that he feels himself impelled or carried away toward this postulate by the entire body of his more profound affective tendencies, once these latter, in adjusting themselves to one another by reciprocally strengthening or weakening themselves, have come to form a harmonious and coherent whole, represented by this supreme end which comprises and satisfies them all.

Yet, the choice of this or that supreme moral postulate and the affective impulsion of our whole being toward this postulate, is determined not merely by "nature" and "nurture" but often in great measure also by one's *Weltanschauung,* that is by the general conception that each individual eventually acquires regarding the nature of the universe and the place of men therein—a *Weltanschauung* which differs in different individuals according to their intellectual capacities and their degree of culture.

Passionately moral individuals, in whom certain morally superior affective tendencies impose themselves upon all other affective tendencies with an irresistible force, experience, it is true, no doubt as to the goodness of the end that they pursue. We may say that their passion escapes the influence of any *Weltanschauung* whatever. In some persons this inward affective impulsion makes itself felt with such imperious force that they come to believe themselves inspired by a divine being who has

commissioned them to spread the Word of God upon earth.

But others do not experience this unique and irresistible affective impulse. They feel move simultaneously within the depths of their souls many affective tendencies which do not always succeed in forming themselves spontaneously into a harmonious and coherent whole, represented by this supreme end which comprises and satisfies them all.

It is the latter class of persons who, if they are morally and intellectually superior, see confronting them the distressing moral problem. It is they who experience the need of an *ulterior push,* whether of internal or external origin, that is to say, of another *why,* of another feeling-urge, in addition to the more immediate and spontaneous affectivities, in order that they may decide to embrace some one moral postulate rather than another. And it is in these cases that the kind of *Weltanschauung* which has been acquired plays a great rôle.

For those who still hold to the religious *Weltanschauung,* the problem is easily and immediately solved, since the supreme postulate to be adopted is that which God has revealed to them through the mouth of some prophet. This postulate they embrace without reserve, impelled as they are by the urgent desire (whether interested and prompted by the hope of recompense beyond the grave, or truly and perfectly disinterested) to please the supreme being in whom they believe, and whom they fear or passionately love.

For those who, inspired by a metaphysical *Weltanschauung,* discover or think they discover the existence of some mysterious cosmic finality toward which certain of their nebulous entities aim, the problem is solved as in the preceding case. For, they endow their pretended entity, in the most confused form it is true, with the more funda-

mental attributes of divinity, and they therefore feel themselves attracted toward this cosmic finality as if it were commanded by God.

Those, on the contrary, who hold to the positivistic-scientific *Weltanschauung* in general, or who, in one way or another, regard it necessary to take the moral independent of the religious feeling, find the desired solution of the problem—when they succeed in finding it—in the fact that they feel pulsating in them, in consequence of some one particular scientific-positivistic *Weltanschauung,* a supplementary affective spring, capable of furnishing support or reinforcement to one or another of the fundamental affective tendencies, upon the play of which depends the choice of the supreme moral postulate.

It is important, meanwhile, to observe that, despite first appearances, we must likewise class under this category those who have attempted and still attempt to construct a "rational" morality. They do so precisely because the inner whole of their more immediate and spontaneous affectivities does not suffice firmly to orient their decision toward some one particular moral postulate rather than toward another. Hence they will truly be happy if they succeed or see another succeed, in demonstrating the "truth" of some particular supreme moral postulate. In such demonstration and, consequently, in the feeling of spontaneous acceptance that every normal mind today experiences towards the result of logical reasoning, as if it was a direct ocular proof, they will find this *ulterior impulse* which they need in order to organize their still undisciplined and incoherent affective substratum under a unique norm. But, as we have shown elsewhere, the nature of reasoning itself, as a series of experiences merely thought of, on the one hand, and the affective nature of each of our springs of action, on the other, render vain every effort at a "rational" morality.

The authors of these attempts imagine themselves successful in their efforts—and of this Kant is a most typical example—because they do not perceive that, before beginning their reasoning, they arbitrarily chose a supreme moral postulate toward which the one or the other of their fundamental affective tendencies spontaneously tend. They then conceal from themselves the arbitrariness of this choice in favor of a long and complicated, but vicious circle, in which they deduce what they postulate from other principles which, in turn, they deduce from those principles which they had originally postulated. Inasmuch as none of the links of this enclosed chain any longer appears as the first of the series, the fact that the adoption of the postulate is arbitrarily and purely affective remains entirely hidden.

These systems of morals called "rational" thus confirm, in the most clear way, the thesis that the choice of a supreme moral postulate must be purely and simply affective.

II

The Supreme Moral Postulate of the Different Philosophical Schools

The majority of the moralists, on the contrary—and the philosophers of ancient Greece offer us the first example—arbitrarily, openly and quite deliberately select some one of the affective tendencies which they feel, or think they feel, active in them and attribute to it a predominance over all others. Among the determining factors is here often their *Weltanschauung* which makes the tendency in question appear as the sole and true tendency natural to man. On the basis of this tendency alone they then adopt their supreme moral postulate.

Thus, certain moralists, not having seen that the ten-

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dency of every living being is alone towards the satisfaction of its affective tendencies (a satisfaction which, under the physical aspect of pleasure, represents an augmentation and intensification of life, whilst the lack of satisfaction, under the physical aspect of pain, has for its physiological correlate a diminution or an interruption of life), have assumed that the supreme end of man consists in seeking pleasure and avoiding pain: in seeking, according to the Cyrenaic school, immediate pleasure, we can say recklessly, without concern for the future; in evaluating and prudently weighing, according to the school of Epicurus, present and future pleasures, as well as the displeasures which may result from actual enjoyments.

But in doing this both schools leave unanswered the question as to what are the affective tendencies to which we must accord preference at the expense of the others; for pleasure and pain are both derived from any one of these affective tendencies, according as they are satisfied or thwarted, and no matter whether they are directed towards the basest material enjoyments or towards the highest spiritual goods.

Other thinkers, preoccupied only with avoiding pain, and knowing at the same time that pain derives from unsatisfied needs and desires, adopt as their supreme moral postulate the limitation of needs or their reduction to the lowest possible point. This maxim, if taken in an absolute sense, leads to a resigned impoverishment of life, which runs directly counter to the fundamental tendency of every living thing. In adopting it the clear mind of the Greek Cynic school seems to have allied itself with the mystic and obscure thought and with the apathetic spirit of Asiatic Buddhism. But this is only a false appearance, for, by this preaching, the Cynics implicitly tended to limit the material needs of man, in order to give ampler and

freer scope to his spiritual needs, whose satisfaction constitutes a still greater augmentation of life.

It was a feeling of pride and a nobility of character, combined with the conviction of their individual impotence to modify by their action the dreary events unrolled in the social environment in which they were compelled to live, and coupled further with a proud desire to render themselves independent of external influences, that impelled the Stoics to seek *great mastery* over themselves, in order to suppress at its very source every feeling which represents a useless affective or emotional reaction against the inexorable unfoldment of external events. They thus acquire, by greatly glorifying themselves for it, this aristocratic impassibility in respect to everything other than their inner feeling, which, if it leads them to great austerity of life, renders them, however, passive and inert in the presence of evil, and, practically if not theoretically, egoistic. Although this be so, their morality is nevertheless one at once heroic and resigned, an exceptional morality, definable as a continual struggle against the most natural instincts and the more fundamental feelings of normal men.

In contrast with the proud but egoistic impassibility of the Stoics, although in harmony with their other principles of moral exaltation, is the preaching of love for all by the greatest moral genius whom humanity has ever produced. But with the evangelical maxim to love others as one's self (a maxim which he borrowed from the earlier prophets of Israel but which he first rendered thrilling for life), with which he attempted absolutely to eradicate individual egoism, he passed so much beyond the affective possibilities of normal men, that there is no more striking contrast than that between the theoretical teaching of this

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sublime principle and its practical applications by peoples who call themselves Christians.

Others have fully recognized that the evangelical morality of absolute altruism, not only exceeds the possible limits of man, but may even be unfavorable to the rising of man, because it eliminates personal interest, that most powerful stimulant to action and essential condition of progress. Moreover, it would become distinctly unfavorable to the latter if it be aggravated by unceasing contempt for worldy advantage in favor of hypothetical celestial goods. These who realize this have set above pure altruism the feeling of justice, a principle which really signifies little if we do not previously specify wherein justice consists. In the first rank of these theories shines that of Kant's categorical imperative, which, indeed, is itself so lacking in precision that one can derive from it the most diverse systems of morals.

For the love of our immediate neighbor whom we meet face to face, so to speak, and who is particularly capable, especially if he is in a state of suffering or pain, of giving birth in us, by way of emotional communication, the altruistic sentiment of piety and of evangelical charity, others, with Comte at their head, have attempted to substitute the love for mankind as a whole, present and future. This concept of humanity in general, however, is too abstract and too remote from actual reality to be capable of substitution for that of "our neighbor."

In its turn, "the good of the species," which Spencer and the partisans of the so-called "biological" morality would set up as the supreme moral end, is even less able to evoke in us such altruistic sentiments.

More practical, and nearer to possible reality, is the moral utilitarianism of Bentham and John Stuart Mill which puts as the supreme end the maximum well-being of

the greatest number. This ethics has found and tends to find a more and more wide-spread application, particularly in our modern democracies. True, the recognition it has gained is less for its cogency as a system of morals, in the specific sense of the term, than for its political applications, it being granted that, according to the principles animating our democracies, every individual really represents in public assembly a single unit equal to all others. In so far, however, as it is strictly speaking a system of morals, this view encounters difficulty in inculcating in the individual coldly, by calm and reasoned exhortation, the feeling which, as regards the springs that impel him to action, will lead him to consider himself as simply on a par with his fellow-men. Besides, since the utilitarian principle represents, not an equation of a single unknown, *but an indeterminate equation of many unknowns,* it follows that it is incapable of supplying, by simple logical deduction, a unique system of morals, well defined in all its aspects. (*Apropos* of this we might recall that John Stuart Mill totally failed in his attempt to deduce from the utilitarian principle the superiority of spiritual goods over material enjoyments.) Finally, it does not appear that all these complicated calculations to which Bentham devoted himself, could have a value in practical application. On the contrary, they tend rather to alienate the ardent souls to whom calculations of this kind are repugnant, whereas every moral system which wishes to win recognition through the communicative transmission of emotions and feelings must count in the first instance upon these ardent souls.

III

The Supreme Moral Postulate of the Harmony of Life

A system of morals that, in our eyes, sums up and

completes those which we have just sketched, and which possesses all their values while yet avoiding their defects, is that to which, imperceptibly so to speak, as a consequence of the natural development of thought, our studies of biological, psychological and sociological synthesis has led us, and which we have already outlined in certain other of our works, under the title of a system of morals based upon the *harmony of life*.

We observe, indeed, and more especially in the man in whom the affective tendencies which impel the individual to action are of an almost infinite richness and variety, that, when two or more simultaneous vital activities occur together, two extremes are possible of realization. Either the two activities are in agreement, in which case they can exist simultaneously and may even reciprocally intensify each other; or, indeed, they are so incompatible that the manifestation of the one implies the arrest or the diminution of the other. Two or more living beings, then, can either give free rein and accord full satisfaction to their different but not contradictory affective tendencies, so that each, entirely by satisfying his own affective tendencies, acts in such a way as to facilitate the satisfaction of the affective tendencies of the other, with a reciprocal enhancement, under the physical aspect, of contentment and joy; or, on the contrary, the affective tendencies of these beings are so opposed that the satisfaction of the affectivities of the one involves the non-satisfaction of those of another, with its train of pain and sadness for this latter. It goes without saying that between the two extremes all intermediate degrees are possible.

This is true, not only as regards the relations between two distinct living beings, but also for the activation in the same single individual of a multiplicity of affectivities which may be either in agreement or disagreement. The

tragic shock which is produced when many opposed passions manifest themselves simultaneously, or, on the other hand, the remorse, repentance, and the discontent with one's self, which we prove when the results of the free activity of a given passion revive the acute pain on the part of another affectivity tending to avoid these results—these are the generators of this so-frequent internal psychico-affective disharmony which constitutes one of the greatest of human evils. This is why we call by the name of "sage" him who succeeds in rendering his conduct coherent, that is to say, who so manages that his more profound and more tenacious feelings, those which better represent, and which constitute, his moral personality, come always to inhibit in time—indeed even to prevent the arousal and to uproot totally—those of his violent but more fleeting passions which would impel him to act in a way opposed to his more profound and tenacious feelings. This *internal psychic harmony through affective "coherence,"* however, differs from the calm serenity which the Stoic sought to obtain *by suppressing* his most fundamental affective tendencies *rather than by rendering them coherent among themselves,* an ideal which caused him to become apathetic and ataraxic (quiescent). In contrast hereto the coherence of the affective tendencies. by virtue of which a greater psychical harmony is established between our fundamental affective tendencies, impresses on our action an impulsion the more urgent and energetic as the affective tendencies, which converge harmoniously toward this action, are the more numerous.

But it is in the relations of the individual to individual that this harmony or disharmony of life is manifested in the most pronounced way. The sexual instinct itself, even as regards, so to speak, its strictly physiological manifestations, can produce either the most complete harmony of

life, when the sexual attraction is reciprocal, or the most painful disharmony, when one of the individuals gratifies his sexual instinct upon an individual of the opposite sex in whom he inspires repugnance. The highest conjugal union, in which spontaneous bodily union is accompanied by spiritual sympathy and is then subsequently raised to a more and more complete fusion and sweetness of spirit, a source of joys infinitely more intense and durable, constitutes, one may say, the prototype of the greatest possible spiritual harmony of life; whereas the profound disagreement which separates two married persons obliged to live together transforms their conjugal life into the most painful Calvary.

The symbiotic relations which exist between the infant and its mother, so necessary for the former and physiologically so advantageous for the latter, give place, in maternal love, to an affectivity stamped with greater and greater tenderness. In consequence, the enhancement of the life and joy of the little being arouses in the mother an augmentation of life and joy multiplied a hundredfold. On the other hand, there is no sadder spectacle than that of those mothers, vastly more unhappy even than perverted, in whom this vital harmony to which they are by nature predisposed, breaks asunder, resulting in hostility and even in aversion toward their offspring.

Family life may equally offer an example either of the greatest harmony and the greatest happiness, or of their most painful opposites, according to the psychical disposition and the conduct of the different members who compose it.

Friendship, which has always been extolled, especially by the philosophers of ancient Greece, as one of the greatest virtues, is such only by reason of the living harmony that it creates, whilst every harmony is destroyed by en-

mity. Generosity in antithesis to straitness of feeling; the altruistic urge which leads us to rejoice in the joy of others, in contrast with envy; the generous pardon and the oblivion of offences in opposition with tenacious spite and the thirst for vengeance: such traits appear to us, respectively, as *moral* or *immoral,* specifically because of the essential harmony or disharmony which they generate.

Likewise, in the economic sphere, the mutual aid that the members of a group extend to one another in the execution of certain tasks (the construction of huts, agricultural labors, etc.) and the division of labor—thanks to which each one produces for consumption some kind of goods in an amount exceeding his personal needs, in order to exchange a part thereof for different goods produced by others and given him in exchange by the latter— represent so many factors of the harmony of life, with increase of well-being for all, whilst robbery and spoliation are means of general impoverishment and embody the typical characteristics of disharmony.

Likewise again, in the legal sphere, the temporary consentient division, by a periodic drawing of lots or a cyclical transfer, of the cultivated ground among the members of the old Russian *mir* or the old Saxon *allmenden,* or the general recognition of the right of each to the use and enjoyment of those goods of nature which are necessary to his labor and existence, constitute, to the advantage of all, so many guarantees of the harmony of life. Conversely, the forcible seizure of the earth, with the expulsion or the reduction to slavery of the original cultivators, or, in general, the violent appropriation of certain natural goods to the exclusion of all other parties, engenders the interminably long series of miseries, provoked by the endless struggle between diverse human groups.

And thus we might proceed. But these few examples

suffice, it would seem, to clarify our concept of the harmony and disharmony of life.

Now, if we elevate this principle of the greatest possible harmony of life to the supreme moral postulate and apply it (as we shall do specifically in the above-mentioned, our future work) to the whole vast field of morals and of law, and to all social relations in general, even to the most refined norms of education, which are the delicate shades of moral precepts themselves, we shall thereby come to construct a wholly consistent system of morals whose fundamental criterion for classifying feelings, actions, and social relations in general, as *just* or *moral* or *praiseworthy* in general, or on the contrary as *unjust,* or *immoral* or *blameable* in general, is solely and precisely whether they are productive, respectively, of the harmony or the disharmony of life.

This coherent system of morality, not only sums up and completes, as we have already said, all the others by preserving their virtues and avoiding their defects; it not only subordinates morality and law to a single principle; but it is the only system, as we shall have occasion to show in our future work, which can function as our most precious compass, capable of guiding the morally superior man in the resolution of every doubtful problem arising in his consciousness and relating to the way in which he should act in complicated and exceptional circumstances, when he finds of no avail the current particular precepts, adapted alone for simpler and more common issues of life.

IV

The Postulate of Harmony Compared with the Postulates of Other Schools

In the philosophy of ancient Greece, the focus of the moral concern was exclusively, or almost exclusively, the

individual; the group figured, when it did so at all, only so to speak, as an accessory halo enveloping the individual. In contrast hereto Christian morality, in some of its developments at the very least, submerges the individual, so to speak, makes him disappear in the collectivity, and annihilates him by its precepts of humility and of complete renunciation. Our supreme moral postulate of harmony, in its turn, considers the individual as an element or constituent who must be inserted into the great stream of all life, in such a way that, while wholly free to pursue his own course, he will at no time impede the least portion of the remaining current. Our postulate assigns thereby to the individual the true place which belongs to him in the whole harmonious system.

It is only by harmoniously inserting the individual in the collectivity that we can obtain in any complete way the inner psychic harmony of the individual himself, a harmony that we will seek in vain to realize if we isolate the individual from the surroundings with which he is necessarily in relations of continual symbiosis. The error of the Stoics consisted precisely in the fact that they considered it possible for the individual to realize his inner psychic harmony, or a complete serenity of spirit, by shutting himself up in his own more profound inner consciousness, jealously and aristocratically maintained and detached and isolated from the whole of remaining society, which they regarded from above with a passive indifference. But they obtained this serenity of spirit, if they ever succeeded in doing so, only by suppressing their more profound social feelings, and often indeed, the most natural family feelings, which nevertheless are the source of the deepest and most intense joy. So that we cannot say that the life of the Stoics appears truly happy. To judge them on the basis of tradition and of their writings,

they appear to us wholly enveloped in a veil of sadness, calm and resigned.

To the mortification of the terrestrial life, to which other developments of Christian morality have tended, the postulate of harmony is resolutely opposed, since the latter considers life as a good, and sees in the more intense worldly joys the greatest of goods, on the sole and peremptory condition, however, that they bring joy, and not misery, to others.

On the other hand, though not admitting, indeed though even rejecting in the most energetic way, the principle of the mortification of life and worldly joys, the postulate of harmony nevertheless unhesitatingly proclaims the great moral superiority of spiritual over material goods, both alike as worldly goods. Indeed, in so far as the spiritual goods are of such a nature that any one can enjoy them without thereby excluding others, they are fully compatible with the harmony of life. Moreover, these goods may be enjoyed only in so far as there are developed affective states free from the narrow egoism of self, and only in so far as there are born feelings of communion with the collectivity that participates in them, which are precisely those feelings that create, maintain and increase harmony itself. On the other hand, material goods can perfectly well be enjoyed by an individual who does not experience any feeling of communion with the life of others, and in so far such goods intensify egoism; moreover, they can become a source of satisfaction to some, only at the expense of others, thus causing a disturbance, often indeed a profound one, in the harmony of life.

The postulate of harmony is able, then, to establish and delimit rigorously the extent of the anathema against sin and the "flesh" (this word being understood as expressing

the whole of material enjoyments in general) which plays such a great rôle in Christian preaching. Our postulate is *in full accord* with this anathema in cases, such as in luxury, orgies, and insatiable lust for riches, where the egoism and cupidity of man are unleashed and given free rein, engendering violence, robbery, hatred, envy, vengeance, and graver crimes, in brief, everything that is in opposition with the harmony of life. It is not opposed to the moderate enjoyment of material goods when this enjoyment may be obtained without increasing the disharmony of life; the less so as it sees in this moderate enjoyment one of the most powerful levers of material progress in our civilized societies, a factor to which we owe art, culture and the progressive elevation of the standard of human life. But, above all material goods, our postulate places spiritual goods. These procure for us the most intense and profound joys, and hence an even greater intensification of life; at the same time, I repeat, by the fact itself that many others can simultaneously enjoy them, they engender a feeling of psychical communion between all those who partake of this enjoyment—a condition which alone insures in the highest degree the harmony of life.

We know, and we have already mentioned the fact above, that, in spite of the resolute efforts of John Stuart Mill, the utilitarian doctrine has not been able to deduce from its fundamental principle, "the greatest good of the greatest number," the superiority of spiritual over material goods. It has been incapable of doing so because, as a rule, it is material goods that men for the most part seek because of the effective well-being that they bring. Now, this superiority of spiritual goods, which all moralists have always acknowledged or of which they have had an intuition even when they have not succeeded in de-

ducing it from the particular principle that they posited as fundamental, may, as we see, be deduced, immediately and very directly, from the postulate of harmony.

From this postulate may likewise be immediately deduced the great Pauline maxim, "Whoever labors not, let him not eat," labor, of course, being understood to include also its highest intellectual forms, which are even those whose yield is the greatest. Indeed, for an individual to win his life by toil, represents the only way of inserting himself in the great stream of whole life without bringing the least harm to others—indeed it enriches the lives of others from the moment when labor furnishes more than is necessary for the individual life of the worker.

The postulate of harmony, "Behold thy life in the greatest possible harmony with the life of others," founds together the two evangelical precepts, "Do unto others as you would have them do unto you," and "Do not do unto others that which you would not have them do unto you." Only, our postulate renders these two precepts more precise and more clear, in the sense that, without forgetting the great variety of needs, tastes, desires, aspirations, and affective tendencies in general which are at work in the hearts of the various individuals, it places as obligatory, not the monotony and unhappy uniformity of life, but the satisfaction of the affective tendencies of each in such a way that, far from thwarting, it facilitates the satisfaction of the affective tendencies of others, even if different. It is thus that harmony is reconcilable with the greatest conceivable variety and intensity of life.

To the passive moral obligation of scrupulously abstaining from everything that may increase the disharmony of life that already exists, our postulate adds the positive obligation to seek to diminish this disharmony and

to introduce into life additional possible harmonies. But it does not admit, indeed it rejects most absolutely, the complete renunciation of one's personality, the annihilation of one's self, toward which, theoretically, and even practically in very many cases, certain developments of Christian morality have tended.

Our postulate admits neither this renouncement nor this effacement, because it sees in the life of each a sacred fragment of life which must be, not destroyed, but put into harmony with the totality of life, in order that it itself may, in turn, enjoy its own life with greater intensity and joy; also because it holds that absolute altruism, or the complete sacrifice, in the ordinary circumstances of life, of the entire self for others, the continual mortification of the self—in case, by an inadmissible hypothesis, such may become the general norm of conduct—would be contrary to the progress of society itself and to the continuous advancement of the level of human life. Of this the past furnishes proof in certain phases of the social development of Christian ideals in their extreme form. Now it is just to social progress and advancement that we owe, I repeat, art, culture and the possibility of enjoying the highest spiritual goods, which establish, reinforce and sublimate the feeling of communion of life.

The postulate of harmony, so far from destroying, actually focuses upon the individual, in order to effect the greatest harmony of life and to secure, as it regards this latter, the greatest possible output, so to say, on the part of each. To this end it imposes upon him a graduation of duties, according to the different categories under which, with the individual as a center, we may classify our fellow-men, even though the latter must theoretically be considered as of equal worth from the point of view of harmony itself. In place of preaching to the individual,

as a moral duty, the abandonment of his own family, and the entire consecration of himself to humanity in general, the postulate of harmony takes into consideration the limited possibilities of the individual and says that,—*under ordinary conditions and in reference to common people,*—man, in his efforts to assure for himself and for others the necessary conditions of existence and the elevation of the standard of life, to eliminate pain, to increase happiness and to transform dissonances of life into so many harmonies, must proceed by observing *concentric spheres*—he must commence with the more limited spheres in which his action can attain maximum fruition, and only then pass to those ever widening spheres in which by the very nature of the case, his activity can yield only a smaller return. Thus our postulate imposes upon an individual, especially and above all, the moral obligation to take care of his own family,—that from whose loins he sprang, later to grow up, and that which he himself has founded—to both of which he is attached by the firmest bonds of human affection, whose needs and the means for their satisfaction he knows best, knowing intimately the attitudes of the different members who compose it. It is only after he has satisfied his more important duties towards his family, and after he has inserted the latter, without harm or detriment to the lives of others, into the great flux of the whole of life, that our postulate imposes upon an individual—lest he be restricted to a too-narrow, family egoism, which is no less reprehensible than individual egoism—the consecration of his activity to his town and to his country, in order to extend it afterward to humanity as a whole, whose enormous extension precludes the work of an individual, if he belongs to the common run of mortals, from effectively yielding appreciable results.

In saying this, we repeat, we have reference to normal conditions and to the great majority of men. Our postulate does not exclude, it even demands, that, for certain individuals in certain circumstances, according to the urgency and intensity or to the qualities of the needs of the respective concentric spheres, the order of the application of activities be inverted, beginning, for example, with one's own city or his own country, as Socrates himself gives us a striking example; or, indeed, when it is a question of a Jesus, that the activity be especially consecrated from the very first to humanity, rather than to country or to family. The criterion always remains that as to whether the individual can make a larger contribution by directing his action upon the one rather than upon the other of these spheres.

V

The Postulate of Harmony Implies less Altruism than Justice

But though the postulate of harmony does not attach to absolute altruism the status of a moral obligation, nor requires, under ordinary circumstances, the entire sacrifice of the individual to the good of others, none the less it extends to such a large number of acts and cases of daily life the positive moral obligation of the individual to put his own life and that of the beings who are dear to him into harmony with the life of others, and to diminish the existent disharmony, that it reveals itself, in this respect, as very much more exacting than Christian morality itself, which, in practice, limits itself to preaching the pure precept of charity in respect to certain unfortunates whom we accidentally encounter in the course of our daily life.

Our postulate, in fact, does not permit the individual

easily to soothe his own conscience by the consideration that he has never by his own direct action provoked the least disharmony of life, or that he has succeeded in resolving some painful contrast in the presence of which he has accidentally found himself. Institutions, laws, the economic regime which springs from them, usages and customs, prejudices and beliefs, education and public instruction, the moral and intellectual standards of the masses, social works of insurance and foresight, works of propaganda of all kinds, and so on: all this complex social regime, upon which the individual himself may exercise a certain influence and upon which he is ethically obliged to seek to exercise the greatest possible influence, is itself the principal cause of the more or less serious degree of disharmony of life, and of all the pain and human misery which, to a greater or less extent, issue therefrom. As respects the vital disharmony that exists within the particular social sphere upon which the individual is able to exercise some kind of influence, our postulate clearly teaches that the individual must feel himself in part responsible, if by his political or social action he has done but little or nothing to modify, however slightly, the social regime itself so as to make it more conformable to a greater harmony of life, or, at the very least, so as to mitigate its more painful and more dismal consequences. As regards party or political programs, our postulate requires of him, that he espouse, not those which are particularly favorable to the interests of his own social class, as the majority of citizens do, but those, on the contrary, which, aiming to realize the most equitable social order, afford a basis for the hope of achieving, on a great scale, a decrease of existing disharmonies.

It is not alone with reference purely and simply to human pain and misery, it is equally and above all in

regard to the most abominable crime and to human degeneracy and vice, that our postulate demands that the individual manifest less horror and repugnance and more remorse, because, if the social structure were different or if more care had been given to the education of the masses, or if social foresight and provision had been more prompt and better adapted to circumstances, this dehumanization of our fellowmen could have been avoided. The "scandal" of Jesus, who did not avoid the society of sinners, is explained by his exquisite feeling of remorse, and by the living and profound intuition, unique to him, that, if these men had been impelled to evil, society shared with them the culpability therefor.

Thanks to this clear vision that in every case of pain and misery, and even in every anti-social act of an individual, there is always a measure of collective fault, the "citizen's" feeling of responsibility is immeasurably expanded so as to include far more than the pure and simple acts of charity which have for their object only some particular fellow-individual. The entire political and public life of the individual remains suffused with a profound moral content.

At the same time, however, our moral postulate is opposed to the too Franciscan and humble spirit of non-resistance to evil. In many cases, defensive struggle against injustice at the hands of others may be the highest duty of the moment—painful as this duty may be—inasmuch as it is the appropriate means for opposing an aggravation of existing disharmony or for inaugurating a regime of greater harmony. The postulate of harmony cannot take to heart the Scriptural precept to turn the other cheek; it repels the principle of non-resistance to evil, not indeed because it does not value the lofty feeling of love and of forgiveness which this principle dictates,

but because the latter would have the immediate and disastrous result of unloosing the thirst for domination and plunder, and this is destructive of all harmony of life. In order to render harmony desirable even to those who tend toward violence and offense, it is necessary to give to all acts productive of disharmony a social sanction of pain, in a measure enough, yet not more than enough, to prevent the culprit himself, or anyone who would imitate him, from repeating the criminal act of disharmony. This infliction of pain, of course, must come from a feeling as distant as possible from that of vengeance; it must rather be accompanied by the aforesaid feeling of collective co-responsibility for every anti-social act; but it is too necessary for society to be able to renounce it.

The harmony of life, in other words, can be but a hard-won conquest. Along with the "struggle for the right" of which Ihering speaks, it is necessary to struggle for an ever increasing harmony of life.

The realization of a greater social justice has in many cases required terrible revolutions; popuar liberty, the primary condition of the harmony of life, has often been obtained only at the price of bloody wars; and the working class has succeeded, only through organization and resistance, in wresting from the capitalist class a standard of life more conformable to human dignity. To be sure, we must seek to render as little painful as possible these graver episodes of great transitory disharmony, so necessary for the attainment of a greater social justice and of a greater final harmony of life, and the representative systems are in this respect the best safety-valves. But, let us repeat, the realization of a greater and greater harmony of life can be but a hard-won conquest. To obtain it, everyone is morally obligated, rather than to illimited resigned goodness and an excessive mildness of spirit, to

virile resolutions, capable of making resistance to evil and of combatting it with the greatest possible energy.

Second Part

THE POSTULATE OF HARMONY IN RELATION TO THE EVOLUTION OF MORALITY AND TO THE FINALISM OF LIFE

Having thus set forth, in its fundamental lines, our postulate of harmony, and having compared it, though very sketchily, with the other principal moral systems bequeathed to us by the past, it remains for us to examine our moral doctrine from the point of view of the evolution of morality and of the finalism of the whole of life, especially in so far as this latter is exhibited and reaches its culminating point in the highest and most profound human aspirations. To this task we now turn.

VI

The Postulate of Harmony as the Point of Convergence of Moral Progress

The simple exposition of the fundamental characteristics of our system of morals suffices in itself, as it seems to me, to demonstrate that its postulate of the harmony of life is the final point of orientation towards which the varying and more or less divergent moral tendencies of each epoch in the end converge, in their evolution and in their reciprocal modification and influence.

Our doctrine, as we have shown, reconciles the hyper-individualistic view of ancient Greece, including that of the Stoics, with the hypo-individualistic view characterizing Christian morality in some of its developments; it constitutes the true mean between the pagan search for material and sensuous pleasure and the Christian morti-

fication of the "flesh," by basing every good and every end upon the quest for the greatest possible harmony of life, which, and which alone, can procure for us those greatest and keenest joys which, while worldly, are nevertheless of a spiritual order. Hence we might call our view,—let us not say a *paganized Christianity,* for the term could be for somebody too shocking,—but a *Christianity become worldly,* that is to say, a doctrine wholly suffused with the feeling of communion of life and of the love of neighbor, so characteristic of primitive Christianity, but gladdened by that typical pagan exuberance of worldly and radiant joy, duly spiritualized.

To an extent more consonant with the possibilities of human nature, our system of morals reconciles egoism and altruism, and thus tries to reduce the flagrant opposition between the theoretical demands of the Christian morality, which too greatly surpass these possibilities, and the daily practice of life in our civilized societies, which remains too much inferior to these same possibilities. Our postulate does indeed not impose absolute altruism as a duty; in respect to this it trusts to the free and spontaneous outburst of the souls of the select few, who feel the communion of their own life with the life of others so strongly that the renunciation of self in favor of others appears to them joyous and of an ineffable sweetness. Our ethics imposes only *justice pure and simple.* But upon this point it is more exacting than Christian ethics itself. It raises, in fact, to a moral obligation for all, as we have seen, a conduct, also and especially in public life, aiming to render the existing social order more equitable, or, at least, more inspired by the feeling of *reparative justice,* in respect to the pains and miseries for which each member of the whole is and must feel himself in part responsible. It does not even accept the excessive Kantian

puritanism which preaches duty for duty's sake, a conception that is too abstract and too vague to set into vibration the cords of feeling, and that produces a feeling of oppression which no joy of life ever comes to solace by its smile; but substitutes for it the profound sentiment of justice, which aspires to bring the smile of life to those as yet unjustly deprived of it because of the existing disharmony. This feeling of justice can be experienced by every morally superior individual, even though he be not an absolute altruist.

The postulate of harmony represents at the same time the intermediate position about which the various excesses of the different moral conceptions and tendencies have oscillated and to which they have more and more approximated as their final state of equilibrium. Against the orgic excesses of material and sensual pleasures, which, by the extreme disharmony of life that they produced, defiled the decline of ancient paganism, there came the reaction, quite as excessive but in an opposite direction, of the Christian preachment with its absolute renunciation of all earthly joys. But, in its turn, the Christian doctrine provoked a recoil, that of the Renaissance, with its return to a true paganism. To this awakening of paganism, there again came a reaction, especially in the countries of the Reformation, with its excessive puritanism, void, this time also, of worldly enjoyment. But this provoked the pagan reaction of modern times,—with its herald and flag-bearer Nietzsche, whom Tolstoi strove in vain to oppose,—characterized by an unrestrained pursuit of material enjoyments on the part of certain social classes and by the most painful disharmony of life for the others.

And within each of these great movements, the same rhythm is unceasingly repeated by innumerable other similar oscillations, smaller and secondary, more limited in

space and time, often reflected in the philosophical and literary writings of the epoch.

But each of the great oscillations between the two extreme poles of the pagan ideal and the Christian ideal, invariably gradually runs down, exactly as a pendulum left to itself, so that they alike tend to approximate to an intermediate position, in which the complete recognition of the full value of worldly life is supplemented by the ideal of the development of this worldly life into the greatest possible harmony; which always implies the elevation of worldly spiritual goods above the material ones.

The postulate of harmony, consequently, presents itself not as *a program* for some specific utopian social regime of the future, nor as a social ideal capable of realization within a hundred or a thousand years, but, rather, as the pole star which has always more or less unconsciously guided, and which will, with increasing consciousness, continue in the future to guide humanity in its upward march, even though the latter will still remain for century upon century infinitely far from it. Our postulate, in other words, constitutes *the fundamental direction* in which, more or less consciously or unconsciously, and in spite of the continual oscillations above-mentioned, of the continual recurring ebb and flow and of the continual digressions in one direction or another, social progress has always maintained itself, or to which, in its uneven course toward a higher moral level, it has always returned after each deviation.

The postulate of harmony constitutes a *touch-stone* by the use of which we may prove and judge the relative degree of civilization attained by a people or an epoch: it is, truly, *the single and sole measure of social progress.*

VII

The Postulate of Harmony as the Ultimate Finalism of All Life

This fact that the evolution of morality leads to and converges upon this supreme postulate, which tempers and synthesizes the most diverse ethical conceptions and aspirations of the past, is natural and inevitable since this ideal of the harmony of life represents the ultimate end toward which, by virtue of an inherent and incoercible impulsion, that portion of the universe tends which alone is capable of finalism, that is to say, its biological part.[2]

In contrast with the inorganic world which, after careful scrutiny for centuries and centuries, shows itself to be entirely a-teleological, that is to say, as tending toward no end, life, thanks to the particular form of energy with which it is animated, impresses upon each of its manifestations an aspect quite clearly finalistic. If, consequently, it is futile and vain to seek for the end of the universe as a whole, it is nevertheless useful to seek, and entirely possible to discover, the end towards which organic revolution tends, which, in the case of man, ascends to social evolution.

Now, the very tendency toward conservation which animates every fragment of living matter brings it about that, when two or more vital activities, instead of opposing one another, come, though but accidentally, into harmony among themselves, these vital activities themselves from this moment co-operate to maintain and perfect this happy and fortuitous symbiosis. By simultaneously satisfying the ends of both activities, this symbiotic alliance

[2] *Cf.* our preceding works on biological synthesis, especially the last, *What is Life?*, with its final chapter on "The Place of Man in the Universe and the New Morality of the Harmony of Life." (French Edition, by Felix Alcan, Paris; English Edition, under the title, *The Nature of Life*, by Kegan Paul, Trench, Truebner and Co., London, in preparation.)

constitutes a first step in advance, which remains as a permanent acquisition and affords the basis for further harmonizations. It is harmony, then, and not opposition, which is the ultimate and the supreme end of life.

If such is the end that already reveals itself in the strictly biological domains, as the way in which organic evolution has proceeded for thousands of years, this revelation becomes even more evident when, with the appearance of man, with the advent of this true sovereign of life, we enter into the social domain.

Every time, in truth, that the particular finalisms or the individual interests of our most remote ancestors or of the small groups that they had already succeeded in forming, come, instead of clashing, to show, whether accidentally or under the influence of some "moral genius," that they are capable of being harmonized with one another, the tendency is born to conserve and reinforce this fusion of particular finalisms themselves, which can in this wise all be equally satisfied in such a manner that the satisfaction of any one of them will not prejudice that of the others. In other words, every new harmony, whether great or small, represents a complex resultant finalism which, because it simultaneously satisfies a multiplicity of individual finalisms and not simply a few of them to the prejudice of the others, rests upon a larger and more solid basis, or, better still, is, so to speak, "supported" by all the converging individual finalisms, in place of being sustained by only a few of them and opposed by the others acting contrariwise. Once realized, this new harmony here again represents, then, a new and permanently acquired stage, whence advances can be made to fuller and more perfect harmonies.

Thus were formed the first social organisms which, from the primitive patriarchal family to the clan and the

tribe and up to our civilized societies, continuously grew in extension and complexity, in co-ordination and harmonious interrelatedness.

In this way man, who is allied in origin with all the rest of the living world, detached himself little by little, and then more and more profoundly, from the latter, for, —thanks to his more and more complex and extensive collective life, and thanks above all to the spiritual communion which social relationships rendered more and more intimate,—it was in him alone that there was developed, under a conscious form, this aspiration, today become irresistible, for the most complete harmony of all life.

This aspiration was at first confused or uncertain and was limited to restricted social spheres. Then it became continually enlarged and more conscious until in our day it has attained to such breadth that it embraces the social sphere in its totality, which we call humanity. This aspiration has always been reflected and today reflects itself more than ever in the two great social problems of *justice* and of *morality*.

Justice has consisted and consists in realizing—in the more or less restricted or extensive social sphere in which it is pursued—the greatest possible harmony between the different particular ends, and between the latter and the collective end, *by way of external adaptation;* that is to say, by means of constitutions and social institutions, and by judicial norms, encompassing and canalizing individual activities. Morality has consisted and consists in seeking to attain the same objective, but *by way of internal adaptation;* that is to say, by modeling and fashioning the affective psyches of the different members of the collectivity in such a way that their particular ends, which find their expression in the affective psyche itself, come into agree-

ment and are spontaneously harmonized among themselves and with the collective end.

There is no more formidable problem than that of justice. It has engrossed human societies since their first rough appearances, from taboo and the law of retaliation up to the most perfect legal enactments of our civilized societies. It involves the whole theory of the State and its institutions from the most fundamental, such as the regime of property, up to all civil and penal legislation; it includes the study of the diverse socio-economic regimes, the different political orders, autocratic, oligarchic and democratic, the different forms of government and the various relations between the individual and the State, from extreme individualism, which leaves the collective goals without defense in the presence of chaotic and anarchic individual ends, up to Hegel's theory of the State, which suffocates particular ends and leaves them to the mercy of the omnipotent collective goal.

There is no more formidable problem than that of justice, we repeat. To its solution leaders of peoples and founders of States, legislators and philosophers, men of action and men of thought, have applied themselves. Yet, all these in the *theoretical domain,* far from always having seen with clarity the essential nature of the problem, have too often been lost in the abstruse nebulosities of metaphysico-philosophical systems which reflected, whether consciously or not, the thought and feelings of narrow social groups,—governing castes or exploitive classes,—who sought thus, by obscuring the true purpose, to retard the advent of this higher human justice, extended to the social organism in its totality, which ran counter to their egoistic interests of partial and limited collectivities. But in the *practical domain* this higher justice succeeds by itself in realizing itself little by little, in extending itself to larger

and larger social spheres, under the incessant pressure of the ends or interests of different classes, strata or groups among the more oppressed. Society thus advances to a more and more complete correction of the most flagrant disharmonies and iniquities. Little by little, and in an increasing number of social relations, it substitutes free and contractual rule, that harmonizer *par excellence* of particular interests, for the rule of constraint, which inevitably subordinates the interests of the majority to those of the minority. Thus we find ever more profound modifications of the entire legal structure of society, along lines more conformable to the greatest possible harmony of interests, not only of some particular class, but of all the members of society.

No less formidable is the problem of morality. Its solution has equally preoccupied the leaders of men and the founders of religions, the prophets and the philosophers, the apostles and men of thought. These also, however, have often strayed from the true road even further indeed than those engaged in the quest for the essence of justice. Misled as they were, especially by religious beliefs and superstitions, which suggested to them other ends, imaginary and fictitious; or indeed prevented as they at other times were from seeing the true goal through the very narrowness of the social sphere, within which, according to their very limited *Weltanschauung,* harmony, as it seemed to them, should be pursued; or, finally, diverted as they were from the proper path by more or less nebulous metaphysical conceptions, which here again represent more or less conscious instruments of the dominant castes or of the preponderant social classes—they were led practically to exclude from the harmony of life the masses whom the others specifically wished to continue to exploit and to keep in submission.

But the continuous progress of science, the advent of positivistic thought and the pressure exerted by the social claims of the great masses, brought finally a dissipation of these metaphysical clouds. Then it was perceived with ever greater clarity (first by the utilitarians, then by Comte, Spencer and all the great moralists of more recent times—even if they did not formulate the doctrine explicitly) that the true object of both justice and morality,—a unique end that each of them must pursue by those means which are available to it,—consists in realizing the greatest possible harmony for all of life in its wholeness, that supreme human end which was already contained potentially in the preaching of Jesus.

VIII

The Postulate of Harmony as the Limit of Psychico-Affective Evolution

As regards the problem of justice, once we have found the most fitting norms for guaranteeing in the best possible way that external adaptation which constitutes its objective, it is quite easy, at least theoretically, to find the means for enforcing these norms. These means consist in the infliction of pain upon transgressors; and it requires only a technical improvement in the administration of this sanction to render it more and more efficacious. With the moral problem, however, it is otherwise. The aim here is to attain an adaptation that is spontaneous and inner, rather than constrained. Hence the question arises whether we can truly hope to succeed in inculcating, more and more profoundly and in growing numbers of individuals, by the affective method, which is the only one at our disposal, those psychical dispositions, different as they may be from one individual to another, which the supreme moral pos-

tulate of the harmony of life requires. And we think immediately of the so-called innate egoism which, it would seem, would impel men, not toward harmony, but rather toward opposition and struggle.

But if we examine psychologically what we call egoism, we shall find that it is at bottom nothing but the gravitation toward its own end of each of the affective tendencies susceptible of being awakened in us. Now these tendencies are numerous and varied. Numerous and varied also are the combinations that they effect when a number of them are awakened simultaneously. Numerous and varied also are the affective tendencies that the moral atmosphere or education, according to their plasmatic action, can generate in a child from the same hereditary or innate affective stock, still unformed and with potential possibilities of infinite developments. Numerous and varied, furthermore, are the new affective tendencies or the transformations or sublimations of already existent tendencies which the apostle can stimulate or evoke, even in the adult, through affecto-emotive communication. Thus it is that what we call human egoism may assume thousands of diverse forms, may appear in the guise of thousands upon thousands of different feelings; and if some of these feelings, simultaneously active in different individuals, run counter to one another, others, on the contrary, are susceptible of being harmonized.

The water in a mountain basin gravitates only toward the bottom of the valley; it can either be left free to precipitate itself as a devastating torrent or be directed by man in such a way as to become serviceable for irrigation or for the creation of energy. Similarly, the still unformed affective nature of the child represents a whole reservoir of psychic energy which the educator or the apostle can divert in one direction or another.

Thus, that fundamental but as yet unformed and undetermined affective substratum which comes to the child through heredity remotely from the primitive instinct to attack, developed in the animal kingdom in the course of the struggle for existence, may become, according to the plasmatic action exercised during its development by surroundings and circumstances, either the vulgar cupidity of the homicidal brigand or the coldest ferocity of a soldier of fortune avid for conquest, or it may become tamed in the pacific spirit of initiative of the courageous industrialist who ever essays new enterprises, or it may even be sublimated into the nobler ambition for moral success, capable of forging ahead to the most audacious and most magnanimous works.

Similarly, that fundamental but as yet unformed and undetermined affective substratum which comes to the child through heredity remotely from the instinct of defense through counter-attack, may take, according to the plasmatic action exercised by surroundings and circumstances, either the form of the implacable thirst for vengeance or of unassuageable hate, or can sublimate itself into the feeling of justice and transform the individual into a social reformer or an apostle.

Similarly again, that fundamental but as yet unformed and undetermined affective substratum which the child receives by heredity from the instinct of conservation under its purely defensive form of flight, may, in the course of its development, either take the baser propitiatory forms of submission through cowardice, of flattery, hypocrisy, lying, perfidy, and treachery, or be sublimated into the disposition of Christian humility or into the highest religious feeling in the presence of the sublime.

Likewise, the spirit of adventure which also draws its vital lymph from the more profound hereditary roots of

the instinct of the restless roving in search for nourishment, can, in its turn, transform the individual into either a pirate or a discoverer of new continents, or into the courageous missionary bearing to the most distant savage tribes the evangelical word of the love which will unite all humanity, or even into the passionate technical inventor of marvelous new mechanisms, or into the thoughtful savant who, by his novel discoveries, revolutionizes the whole of science.

In the same way, an innate potential accentuation of the sexual instinct may assume the most vulgar forms and cause the child to become a debauched adult, a libertine or an exploiter of women, or, on the contrary, be refined into the somewhat superficial types of the chivalric sentiment of the middle ages toward the various more or less chaste castellan's ladies, or again may be truly sublimated into the purest idealization of the gentle creature who ennobles all our lives and who inspires the greatest masterpieces of art —plastic, poetic or musical—which embellish and elevate all life.

And so on in turn.

One and the same innate and fundamental affective substratum, still unformed and pluripotential, that is to say presenting infinite possibilities of development and orientation, may, then, give place to affectivities which harmonize with or are opposed to the affectivities of others. What will never be possible of attainment is the annihilation of all our affective activity, the suppression in us of every desire and every aspiration, in brief, the renunciation of our life which is active and throbs irresistibly in us, by virtue precisely of the accumulated energy which gives impulse to our entire being.

The aspiration to a Buddhistic nirvana is not so much immoral as it is contrary to nature. But the directions

which desires, aspirations and life can take are various; and whereas some of them lead to painful oppositions for ourselves as well as for those with whom we have to do, others may produce harmony and joy for all those affected by them. Everything, let us repeat, will depend upon the plasmatic action exercised upon our affective nature; plasmatic action, which cannot be exercised by the educator or the apostle except through the communication of feelings and emotions.

From this point of view the supreme moral postulate of the harmony of life commends itself not only to the intellectual comprehension and cold acceptance of the philosopher and the thinker, but also, in perhaps even greater measure than any rival doctrine, to the spirit of impassioned propaganda and enthusiasm. Because, though wholly based upon the feeling of the communion of life, inherent in the Scriptural love of neighbor, nevertheless, it does not, as Christian morality does in certain of its developments, undertake to impose renouncements which overtax human powers and are contrary to the very nature of life. Besides, while aiming to realize agreement between different vital activities, it nevertheless does not attack but respects and even advocates the greatest possible variety of feelings and dispositions; it favors in this manner the fullest expression and the most spontaneous expansion of the diverse individual personalities who, by very reason of their diversity, are the more capable, if properly oriented, of coming into harmony one with another.

This is why in the course of the psychico-affective evolution of man, normal people have, *in practice,* accepted and taken to heart, from among the diverse principles of the various philosophical schools and among the diverse precepts of the most varied and often even the most extreme moral preachings, only those which were adapted to this

harmony of life. This is why the whole moral conformation that modern civil societies tend to impress upon their members—through direct education, through the social sanction of approbation or disapprobation, through praise or blame, esteem or contempt, and the entire social atmosphere that they create—converges upon a progressively better adaptation of the individual to a peaceful and civil human association, which progress tends to render ever more equitable and harmonious.

We might then say,—and this will be more fully set forth in our future work,—that all the psychico-affective evolution of the more highly developed portion of humanity is already oriented, and tends to become ever more and more oriented, toward the supreme ethical postulate of the harmony of life.

IX

The Postulate of Harmony as the Supreme Human Aspiration

At this point it becomes necessary to distinguish between the select few who possess a proper inner life, who are profoundly tormented by the moral problem, and who seek to take account, by themselves, of the supreme end by which they should direct their lives, and the great mass, consisting of those who accept unreflectively and more or less passively the predominant conceptions which society tends to impress upon them.

Now, in respect to the select few, there is no doubt that they already possess to some degree the feeling of the communion of life, by reason of which we experience the joys and sufferings of others as our own, and that this feeling is on the way of a continuous development. On the one hand, social progress itself, by continuously augmenting the number, variety and frequency of social relations, and

by bringing more fully to the consciousness of each the conditions under which the others live, renders the contact between all members of the collectivity more and more intimate, with the result that the individual can less and less ignore the pains and miseries which still fall to the dreary lot of some of his fellowmen. On the other hand, the great richness of the affective psyche of the chosen few, the infinite delicacy and the exceedingly fine shades of feeling of which it is capable, together with the facility and rapidity with which any variation of feeling can be evoked in it, render this moral elite all the more "sensitive" to the affective and emotive states of others. In other words, just as any note whatsoever always finds resonance in an instrument composed of thousands and thousands of strings, so no matter to what joy or to what suffering of others one of these select group of persons attends, it immediately finds its resonance in his delicate affective psyche. In these favored ones, the supreme moral postulate of the harmony of life corresponds to their inmost feelings. To do everything in their power to attain the greatest realization of this postulate, such is the duty which imposes itself upon their consciences spontaneously, and whose accomplishment is even for them the sole and single means of enjoying, without remorse and completely, their own happiness.

But the mystics themselves, who project their own finalism into the entire universe, and who are convinced that the cosmos is ruled by a supreme and benevolent will, can recognize in this harmony of life the end truly pursued by the divinity in whom they so ardently believe. Could this divinity, indeed, propose any other end which corresponds so perfectly as the harmony of life to those highest and most profound aspirations of man, in the realization of which man sees the supreme end of the whole creation?

The supreme moral postulate of the harmony of life can thus supply the point of coincidence and of agreement between the believer and the positivist. Both can thrill in unison at the vision of this resplendent human end.

The positivist reaches this postulate by an investigation into even the deepest and most profound recesses of the finalism of life as a whole, that is to say, of that portion of the universe which alone he recognizes as effectively teleological, as truly tending to an end under the irresistible urge of its own inmost nature. The believer can deduce it, as indeed he has already done, from the conception of God, the loving father of all men, who are urged by Him to love one another as brothers.

To the mystical communion of the believer with God there corresponds, in the positivist, if he is one of the chosen few, the feeling, *which he verifies introspectively,* of the communion of his own life with the whole of life—a communion which immediately elevates his feeling to a grandeur that the religious feeling itself has never attained; a communion which immediately sublimates the belief in and aspiration for survival after death into a different conception and into an aspiration for an immortality other than that of a narrow individual survival.

That is to say, the aspiration so to act during life as to remain, even after material death, *a factor still active for progress and for good throughout generations to come* —this being rendered possible by the fact that social evolution (thanks to the mnemonic property which characterizes life in general and which is maintained, and even accentuated, in collective life), not only conserves and accumulates, for the good of future humanity, every economic conquest and every item of technical or scientific progress favoring the material or spiritual elevation of man, but also jealously preserves, for generations to

come, every feeling, every word and every deed which have contributed to augment the harmony of life, transmitting them fully vibrant of working efficiency into the most distant future.

The discoveries of a Watt or of a Volta, of a Jenner or of a Pasteur, contribute even today to increase well-being and to diminish human misery; a melody of Bellini, a symphony of Beethoven, even now set into vibration, in millions of hearts at once, the feelings of sweetness and peace which animated their creators at the very moment of their composition; the word of Jesus still resounds, very sweet or stern, as an appeal to peace or as an admonition to justice, amongst men who tear one another to pieces for purely material interests. That which constituted the noblest and the most spiritual element in the psyche of these men still exists, in its effective vibrations and in its beneficent results, as it did in the epoch when these morally great were still alive. In so far one may say that this part of them is truly immortal.

Nor could one say that then the number of these elect men capable of aspiring to this new and higher immortality will always be very small. Because no good action, however insignificant it may be, no deed of justice and of love, however slight, will ever be lost: in communicating itself from individual to individual, it will always remain actively beneficent even in the far off centuries to come. The first feeling of sweet attachment of male for female, which arose in the far distant past in the affective psyche of one of our remote ancestors, the first pulsation of tenderness of the mother for her offspring, toward whom she had hitherto been attracted only because of the purely physiological satisfaction she derived therefrom, continue even as yet to reverberate beneficently in the highest and most altruistic family feelings. The feelings of love and

of forgiveness which animated the anonymous crowds of the first Christian martyrs—perhaps the happiest of mortals, because they alone experienced to its most exalted degree the rapture of a complete communion of life—and which impelled them smilingly to face death, still reverberate in the fullest and most profound way, and inspire down to our own day the greatest creations of art.

We may say, then, that, as regards the nobler part of his soul, every one enjoys a degree and duration of survival proportionate to the good of which his efforts have been productive during his life.

Moreover, every one can prolong the existence of his beloved who have died, and feel them living again in him, if he will seek to bring his feelings and his acts in conformity with such of theirs which best corresponded to the supreme and beneficent end of the harmony of life.

In this continuous and active endeavor, aspiring strenuously to the good, every one can find, even in the presence of the greatest inevitable griefs, the consolation and the resignation which the believer acquires from his hope of a future life. And every one can escape the bitter feeling of isolation and of discouragement in the face of the gravest adversities,—from which the anchorite seeks to extract himself by taking refuge in God,—if he has thrilled and if he truly thrills in living communion with his fellow-men. Knock and the door will be opened, we read in the Gospel. Love and you will be loved in return, says the postulate of harmony.

A religious attitude,—if we wish to preserve this term to designate all idealistic aspirations,—thus tends to substitute itself in the place of the old, by assuming new forms in full accord with science, enlarging its horizons, and carrying its ideal to higher and higher levels. By recognizing and feeling himself as but a small though

a so throbbing part of the great current of the whole of life, which, itself, is truly immortal; by experiencing in an ever more intimate and profound way the feeling of communion and the need of agreement between his own life and that of others; and by behaving, in consequence, in such a wise as to remain an active factor for good even in the remote future,—it is thus that the new positivistic idealist discovers how completely to fill his own existence with a worthy goal, how fully to satisfy his own aspirations —aspirations which are no less profound, no less irresistible, no less elevated than those of the believer inspired by the purest religious feeling.

And in the radiant vision of this harmony of life, joyous for all, ultimate and supreme end of life itself, the new positivistic idealist finds comfort, confidence and encouragement in his incessant work for the good.

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EMPIRICAL IDEALISM IN OUTLINE

TWO facts appear to me fundamental when I reflect upon my experience of life and the world. The first is that external stimuli continue to act on my organism and to evoke a succession of motor responses. The second is that I understand or interpret these stimuli by giving them place as objects or events in the more or less permanent system I regard as the world. Not *my* world, but *the* world.

These two facts on which as twin pillars my experience seems to rest are brought home to me by every act of perception. When I was writing one of the above sentences my attention was momentarily diverted by a wagon passing along the street beneath my study window. In this case an auditory stimulus, a continuous creaking sound I would describe it in retrospect, induced a readjustment of the apparatus of visual fixation and regard, i. e. drew my gaze away from the paper to the window and the street outside. Now such motor readjustment, called forth by the object of perception, is, in the degree to which it is conscious at all, a virtual acknowledgment of the external existence of this object as a particular source of present stimulation. But the character which perceiving intelligence recognizes the object to possess is resolvable into a complex of properties and relations. And the properties and relations which give an object its distinctive character

serve (because they are general) to link it with other kinds and types of objects in an orderly, enduring, and meaningful, world. To perceive the object in my illustration as a loaded coal-wagon is to give it significant place in the winter life of this city and to relate it intelligibly to the household economy and organized industry in the nation and throughout the world.

Now the two facts in question which I regard as basic to human experience may appropriately be taken as the starting-point of philosophical enquiry. Indeed each one has, of itself and apart from any further inferences to be drawn from it, important philosophical significance. The first fact is the standing refutation of subjective idealism, of all forms of 'mentalism.' Objects demonstrate the independence of their existence by the control they exercise over our action, both as external sources of stimulation and as conditions which limit our bodily movements. The second of the two facts stands as an equally conclusive refutation of that naive materialism which admits no influence but that of physical impact, no relation except that of the external determination of one object or event by other ones contiguous to it in space and time. Unless objects sustain, besides this, some relation which integrates them into a coherent system, i. e. have some intrinsic order and unity, they cannot form parts of an intelligible world. For the distinctive and permanent characters which we recognize objects to possess are inseparable from their position and relations in the organized world of intelligible meaning.

It would be a mistake, however, to infer from this latter fact (that intelligence is a reaction not to an external stimulus merely, but to the world in its intelligible unity and to external objects as constituents of this unity) that the objective world is constituted by thought. Instead,

a correct inference would be that because the world proves to be intelligible it must have an intrinsic order and unity which it would not have if its parts were determined merely by physical antecedence and consequence. Its parts must be such as to imply the intrinsic character, the essential nature, of the whole.

Pursuing this line of thought, we might be led on to a further inference which would be unwarranted. This would be to conclude that because the existing world has intelligible unity, it has teleological unity as well, in the sense that all its parts are related as means to some end we judge good. The requirements of intelligible order and system might be satisfied, as far as I can see, by some space-time-mass relationship which correlates all parts in terms of mathematical ratio and function. The fact seems to be that while our intelligence is bound to assume that the world possesses some kind of order and unity, we are warranted in ascribing to it only such kind and degree of unity as it proves on empirical investigation to have.

Two activities or responses of everyday experience bring us into contact with the real world and give us information as to its character, viz. *action,* and *appreciation.* The difference between them is not that action consists in bodily movement while appreciation is a mental or intellectual activity. Both are psycho-physical responses; they are expressions of intelligence and at the same time involve bodily movement. *Action* is the attempt of individual intelligence through the agency of bodily movement to bring about some change in the physical relationship of objects within its sphere of influence. Such change may be brought about by bodily movements which merely alter the location of the agent relative to surrounding objects; or the agent may, through movements of his own, initiate a series of changes in his physical environment. *Apprecia-*

tion is an effort to discover relations which exist among objects in virtue of their intrinsic character, relations which give them meaning and value. These relations individual intelligence seeks to realize through the instrumentality of motor responses confined to the body of the agent and hence more completely under his control, such as aesthetic appreciation, articulate speech, and incipient manipulation.

Of course these two responses, action and appreciation, are not separate powers or faculties which operate in independence of each other. We are prompted to act, and the course of our action is in a general way predetermined, by the attractiveness of the ideal object which appeals to us as desirable. And appreciation not merely discerns meaning and realizes values which exist; it imagines possible meanings and values which require to be verified by action and experiment. No, the distinction between action and appreciation is a distinction of function which (as we have seen) is rooted deep in the underlying conditions of human experience. Action is concerned with the sequence of bodily movements which must be made, or of physical changes which must be effected, if the characteristic qualities of objects are to become available for our own experience and enjoyment. Appreciation, on the other hand, is preoccupied with the meaning and value objects are found to possess when realized by effortful action.

Action *per se* is not interested in the end or goal for itself but in the steps which must be taken to realize it. As action its primary concern is with bodily movements and physical intermediaries, with material agencies and mechanical instruments. It cares nothing for the intrinsic nature of any motor response or physical process it employs, however; it is only interested in the tendency of such a chain of physical intermediaries to produce a specific result —whether, that is to say, it is, directly or indirectly, a step

toward the projected terminus. In other words, action is concerned with motor responses and physical events only in their order of succession, their sequence of occurrence. Its competence is measured by its ability to make that sequence of bodily movements or to initiate that series of physical changes which will lead most directly and efficaciously to the chosen end, the realization or appreciation or enjoyment of the qualities of the selected object.

Action and the results of action are one principal source of information in regard to the nature of the existing world. Physical science undertakes the investigation of the real world as it reveals itself to human action and the observation which accompanies action, and its conclusions summarize in systematic form the knowledge to be gained from this source. Its method is that of reflection on the observed results of action and the verification by detailed experiment of the hypotheses suggested by these observations. Its interest, of course, is not in a particular practical result to be gained by initiating a series of physical changes but in discovering such invariable sequences of physical changes as constantly occur. It has, by the aid of an elaborate technique of experimentation, been successful in discovering many such uniformities of external determination among physical events—laws of nature, we call them. Methods of exact measurement have brought to light relations of quantitative equivalence and mathematical ratio among different event-sequences. These uniformities give coherence and regularity to the external world; they show it to be in truth an *order* of physical events.

The second class of responses above-mentioned, those of appreciation, are, as we have seen, also psycho-physical activities, and concern themselves not with physical existence, but with the intrinsic meaning and value of real ob-

jects. Now the value which is thus discovered and verified inheres in those qualitative differences in the real world which natural science ignores. The object *as appreciated* is always a complex or pattern of diverse but inter-related qualities. Are any uniformities of relation discoverable among objects in this their aspect of value which organize them into a system whose objective reality can be empirically verified? The answer is affirmative. *Insofar as it possesses real value an object as a complex or pattern of diverse qualities is so related to an inclusive system of similar objects as to acquire various possibilities of functional contribution to the developing unity of such system.*

The various potencies of functional contribution with which objects are endowed are brought to light by the three responses of appreciation above-mentioned which, while they are in a sense co-ordinate, at the same time suggest three stages in the progressive realization of the value of the actual world: appreciative understanding, practical invention, and aesthetic perception. These appreciative responses involve on the motor side articulate speech, practical manipulation and contrivance, sensory adjustment and emotional expression.

A. *Appreciative Understanding.* The diverse qualities which give each object its distinctive character are present in varying degrees and combinations in other classes and kinds of objects and serve to link it with them in a coherent system which is implied as the meaning or significance of every particular part or member. In this system, the general types or classes of objects reflect the continuing interests and purposes of intelligent human life. These interests are at first comparatively limited and transient, and give rise to interpretations correspondingly subjective and anthropomorphic. But the controlling interests become more comprehensive and enduring until they finally

become that of the description and correlation of all objects for the purpose of communication and contemplation. As these latter motives become dominant they direct attention to the nature of the objects themselves rather than their uses, thus leading to interpretations increasingly objective. Among such are the physico-mathematical interpretation of physical science originally formulated in the interests of action, the genetic or evolutionary interpretation in terms of development and emergence, the ethical interpretation in terms of personal communication and association. But in all these interpretations the identities or uniformities discovered are, from the standpoint of appreciative understanding, identities in difference, uniformities which correlate objects of different character into an organized system.

B. *Practical Invention.* When the distinctive character of each object is thus understood, it reveals possibilities of development and transformation (through a reorganization of its constituent qualities in connection with the qualities of other objects) in virtue of which it can make new contributions to the unity of the whole. Thus physical materials and forces, vital energies and psychophysical tendencies, prove instrumental to the rational uses of mankind. These uses are at first limited, exclusive, temporary. They become more enduring and inclusive until they become that of constructive achievement: the cooperative conquest and control of existing nature.

C. *Aesthetic Perception.* All objects in virtue of the organization and harmony of their own intrinsic qualities are capable of reflecting or expressing in some degree the larger whole of which they are parts. Such intimations and revelations to aroused perception, imagination and emotion are at first sought for the pleasure they give or for some ulterior advantage they gain. But as through

the exercise of these responses the objective experiences become more adequate and significant they are sought for the reconciling sense they afford of the unity of all values and of the rational life in which they are realized.

It follows that the discovery and realization of the system of values implies or involves the community of personal intelligence. The various possibilities of functional contribution to one unfolding system which existing objects possess are realized by a society of intercommunicating individuals, each selecting those which appeal to his own nature and capacities and participating by communication in those realized by others. The joint realization of objective values associates all individuals engaged by common insight and mutual understanding, by cooperative endeavor and imaginative sympathy.

Now the objective values thus discovered first appear as ideal possibilities. The responses of appreciation always involve bodily reactions, it is true. But in the first formulation or envisagement of values the motor reactions are confined to the body of the agent and so (within the limits set by hereditary structure and habit) within his control. They consist, of course, of implicit responses of language, motor manipulation and perceptual readjustment.

The verification or social realization of these values depends, however, upon the extension of these responses into the outer world in the form of overt action which has to encounter the limits set by the external environment. Consequent upon the threefold division of the responses of appreciation such action which is genuinely experimental takes the form of consecutive discussion, practical contrivance and invention, or artistic creation.

Many of these possibilities of real value have been explored and verified by mankind in the history of social culture. Values thus discovered have been objectively ex-

pressed and embodied in political procedures and institutions, scientific and literary writings, works of fine art, and industrial methods and appliances.

These values already discovered by social intelligence may be realized by the human individual through participation in the organized, institutional life of society. Such participation is effected through the bodily agencies or media of inter-communication already referred to: articulate speech, practical invention, and aesthetic-emotional expression. Habits of speech, of social adjustment and address, of mechanical control and industrial skill, of perceptual synthesis and emotional resonance, enable the individual to appropriate the cultural achievements of his fellows. Through intercommunication mediated by these agencies the individual is enabled to share in the significant experiences of humanity, their insights into the nature and order of the world, their adaptation of existing materials and forces to rational uses, and their intuitive perceptions of fundamental harmony.

Any original contribution on the part of the individual to the discovery and realization of the values of the world depends upon his own initiative and enterprise. He must take the risk and assume the responsibility of acting upon those potencies of coherent meaning, of teleological order, of organic fitness, of unfolding harmony, in the world of nature and of man, which have appealed to his selective intelligence as genuine and supremely valuable. And while the possibilities which he envisages may not be borne out or confirmed by the results of action, he cannot entirely fail. For his experiment, so far as it is intelligently conceived and capably executed, cannot fail to be illuminating and profitable to himself and others—by proving that some apparently genuine possibilities are blind alleys and suggesting other more promising paths to fulfilment. Besides,

such effort will identify him more effectually than anything else could do with the co-operative endeavor carried forward by the leading spirits of humanity to explore and verify the real meaning and enduring significance of man's experience and his world.

To return then to the original question of the kind of order and unity possessed by the actual world. Empirical fact when consulted indicates the presence of two types of order in the world, mechanical and teleological. On the one side is the physical system, the order of events in space-time, of mass-points or force-centres whose changes show uniformity of external determination. On the other side is the objective system of values, the system of significant objects which by virtue of differences in intrinsic character possess coherence of meaning, possibilities of adaptation and development, and expressive harmonies. Each system seems complete in itself, and exclusive of the other. Is this dualism final and insurmountable? Is the world divided against itself into two opposing kingdoms?

Certainly no monistic interpretation which does not take cognizance of, and build upon, the facts indicative of duality in nature and in man, deserves serious consideration. If the real world possesses any ultimate unity it must be a unity which maintains itself in, and realizes itself through, opposition. And indeed what appears as radical opposition may well prove on further examination to be the essential condition of functional interdependence. That this is true of mechanism and teleology, existence and value, is suggested by the evolution of social culture. The externality of physical nature and this alone gives human individuals a common field for the exercise of their intelligence in the organization of co-operative life. The mechanical regularity of physical processes is the indis-

pensable condition of their adaptation to the rational uses of intelligence. These are facts which idealists should take notice of. On the other hand, it is only through and by means of associated human intelligence that the sequences of physical process acquire rational significance and become the media or symbols for expressing and communicating the permanent meanings and enduring values discovered by human intelligence in its natural and social environment. This is a fact which the behaviorist should not forget.

As we have seen, the objective system of values is an organized system of ends through whose discovery and appreciation the community of personal intelligence is realized. Now are we to think of this community of intelligence as limited to man in whom the forces of universal evolution may be supposed to have come to self-consciousness? Or has it a wider scope and a more permanent existence than it could possibly have if limited to the life of the human species on this planet? Are we justified in regarding the existence of a universal or cosmic intelligence as a necessary implication of the objective system of values? Two arguments set forth more fully elsewhere[1] appeal to me as relevant and (as far as may be) convincing. In the first place, we do not hesitate to agree with the natural scientist that the order of physical events which is *not* a fact of direct experience but an inference based upon the facts of common perception, did exist throughout the whole course of evolution as the real framework within which the evolutionary process in all its phases, of value as well as of physical occurrence, took place. But the attributes of value are features of existence no less important and actual than its physical properties. And they require for their explanation, as we

[1] *Cf.* H. W. Wright, "Does the Objective System of Values Imply a Cosmic Intelligence?" *International Journal of Ethics*, April, 1928, pp. 284 ff.

acknowledge, the community of intelligence. The latter is therefore on an equal footing with the order of physical events: both may with equal right claim to be the truth of the world of existing fact. But why then suppose that the earlier stages of evolution before men appeared proceeded within the space-time frame exclusively, and not within the organizing, associating unity of intelligence as well?

Suppose it to be objected that consistently with evolution we must suppose intelligence to have been latent or potential in the world until it emerged in the human (or other) species. The answer will bring out our second argument which turns upon the origin of the system of values. In the case of the physical system we account for its beginnings in terms of the same uniformities that govern its present changes—processes of redistribution of matter and motion. The real existence of the system of values means the existence of another type of relation, the relation between particular objects and events and the organizing unity or whole which includes them by virtue of their intrinsic adaptability and their distinctive possibilities of functional contribution. Now in what sense can this organizing unity exist, potentially it may be, but nevertheless really and effectively? Can its existence be understood except as an anticipatory selection of objects, of existing materials and agencies, on the basis of their intrinsic character and fitness? Such selection may mean simply the immanent order of nature or, more definitely, the effective ordering which proceeds in the natural world. Only, in so far as it involves anything that can be fairly understood as an anticipatory selection, it implies the influence at all stages of an inclusive or ordering intelligence.

Are we to think of the cosmic intelligence as including within the scope of its experience all the values of exist-

ence completely realized? No, my answer would be, such intelligence may be thought of as comprehending and conserving all values which have been thus realized in the course of evolution, and guaranteeing that the further possibilities of value resident in the world are real possibilities.

Whether we can gain further knowledge of the character and content of the Universal Mind or Will depends upon whether religion is what it pretends to be, an independent source of experience and information in this field. It is not my purpose to discuss the validity of this claim but merely to point out how the religious response relates itself to the problems we have been discussing. Religion proposes the present realization of the objective system of values in its entirety (as thus far developed) through communion or communication with the Cosmic or Universal Intelligence. The only available means of such communication are the three psycho-physical agencies referred to above: articulate speech, practical invention and aesthetic perception and expression. Employed as means of realizing the universal system of values through 'communion with God,' they take the form of the three distinctively religious responses of *prayer, devoted service,* and *worship.*

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THE PHILOSOPHY OF WORSHIP[1]

THE philosophy of worship involves a philosophy of religion. Our space is too limited to set forth a philosophy of religion, of course, but we can indicate certain essentials in such a philosophy which bear most directly upon worship.

We divide worship into three kinds. Only one of these three is sustained by the philosophy which we shall propose. There is, first, the kind of worship which might be called begging. It is asking God for this and that. There is, second, the kind of worship which might be called feeling. It is worship directed to the end of attaining a certain kind of experience. This subjective state may be exultation, peace, comfort, soothing restfulness, "communion," deep emotional stir. The good of this feeling-state is sought and attained in this second kind of worship. Third, there is the worship which is a kind of practical problem-solving. All practical problem-solving directed to high moral ends is not worship. But such problem-solving may be worshipful. Some kinds of problems cannot be adequately solved in any other way than by worship. This problem-solving worship may well take the form of petition at a certain stage, but it operates according to the recognized principles of practical achieve-

[1] A lecture delivered in the Open Court Conference Room, on Nov. 1, 1928, as the first of a series of addresses by various scholars in the field of the philosophy of religion. [Ed.]

ment and at the same time is a way of dealing with God. It is the kind of worship our philosophy upholds. In order to expound it we must first define religion and then set forth the idea of God in such a way as to show the religious character of this kind of practical problem-solving. Also we must distinguish between worshipful problem-solving and that which is not worshipful.

All the practical endeavors of man may be conducted either intelligently or unintelligently. The same is true of religion. Government or politics may be either intelligent or unintelligent. So also may industry and friendship and home life. But when one proposes seriously to set forth the philosophy of politics, as Dewey did in his *Public and Its Problems.* it is intelligent politics which is the chief matter of concern. So also when Hocking or Whitehead or Hobhouse try to formulate the philosophy of religion, it is intelligent religion which they chiefly want to portray. So also it is intelligent religion and intelligent worship which we here want to discriminate and define. Some, of course, will claim that there is no such thing as intelligent religion and intelligent worship, just as others have claimed there is no such thing as intelligent philosophy or intelligent politics. But such judgments are plainly pre-judgments or prejudices.

Intelligent religion we define as man's endeavor to do two things: (1) attain most adequate knowledge of that upon which he must depend and with which he must work in order to reach the greatest goods, and (2) establish with this something those relations through which these goods can be achieved.

The first of these two endeavors, taken by itself alone, would be a branch of philosophy. It becomes religion only when connected with the second endeavor which is a very practical form of human striving. Intelligent religion always includes a philosophy or one branch of a philoso-

phy. It entertains and develops certain theories about the world, particularly theories concerning that aspect of the world which is believed to bear most critically upon human destiny. Philosophy stops with the formulation and demonstration of such theories. It becomes a religion only when the theory is followed up by the practice of living in such a way as to strive to enter into most beneficial relations with this which is believed to determine human destiny.

The word God may or may not be used to designate this object of philosophical and religious concern which is the value-making process in which and with which man must work to attain the best that life may offer. We prefer to use the word God, however, and believe we are altogether consistent with most ancient usage when we do so. The idea of what this value-making process, or determiner of destiny, or chief religious object may be, has varied immensely through the ages. In some religions the word God or its synonym has never been used at all to indicate this chief object of religious interest. Buddhism in its classical form is an example. Also there are many people today who are deeply religious in as much as they earnestly undertake the two-fold endeavor which constitutes religion, but who have no use for the word God. In some cases the connotation of the word for them, because of their early training, makes it psychologically impossible for them to use the word. Nevertheless we believe much circumlocution is saved and on the whole understanding is promoted by retaining this term. We shall, then, speak of God as that which the religious man seeks to know and with which he endeavors to establish most beneficial relations.

We have defined intelligent religion as a theoretical and practical undertaking, theoretical inasmuch as it is

an endeavor to know God, practical in that it seeks to live in such conformity with God as to attain the good which is to be found either in God or by means of God. In our definition we have deliberately omitted feeling. To be sure feeling or emotion is found in religion, as in everything else man does. But feeling grows sickly and sentimental when it becomes a goal of endeavor. It is for this reason that we reject the second of the three kinds of worship described above. If feeling is to be wholesome and healthy it can enter only as the incidental accompaniment of endeavor directed toward ends of great practical and theoretical importance. Hence feeling does not come into a definition of religion when religion is defined as a kind of human striving toward distinctive goals of endeavor, because feeling is not properly one of these goals.

Perhaps the place of feeling in religion can best be made plain by considering an analogy. Take the case of two mothers. One mother takes care of the child primarily for the sake of the experience of motherhood. The child's welfare is incidental; the chief thing is that she should have the desired experience, whatever may happen to the child. If the child should die, the first consideration would be that she should have a "broken heart" such as mothers are supposed to have under such circumstances. If the child should live despite the fact that his mother had used him as a tool to crank up her own sentiments, and if he should make a great success in life, the most notable fact would be her own "raptures of mother love." The second mother, on the other hand, is so devoted to her child that she forgets to cultivate her own sentiments and take note of her own experiences. She is so occupied in solving the intellectual problem of ascertaining what are the child's real needs,

and the practical problem of supplying those needs, that her own feelings merely happen to her without any thought or effort directed upon them. She is scarcely conscious of them and certainly could not describe them in such detail and beauty as the first mother. Her own feelings do not constitute one of the goals of endeavor and she does not self-consciously cultivate them. That does not mean that she necessarily has less sentiment than the first mother, but she is less sentimental. Her feelings are just as strong, doubtless stronger, but they simply happen to her without thought or care about them at all. This, we claim, is the healthy normal way in which feeling should be experienced, whether in religion or elsewhere. It should never be the object of regard but merely the natural concomitant of interest directed upon some other matter. Therefore feeling, while it enters into religion, is not properly an objective of religion and is not a part of our definition.

There is a sickly, sentimental kind of religion which is chiefly concerned with a certain feeling state called religious experience. God is incidental to providing this experience. If this experience can be had, the intellectual and practical problems of religion can take care of themselves. But such a religion, we claim, is diseased. It is pathological. Intelligent religion, on the other hand, follows the opposite course. It seeks first of all to solve the intellectual and practical problems of religion. It leaves the feelings to take care of themselves.

Man is the most sentimental of all the animals. He will drink himself to death if the maudlin state of intoxication puts him in a condition in which his feelings can be aroused most freely. So likewise he takes to the religion that puts him in a maudlin state of sentimentality. He will die for such a religion even more readily

than he will die for intoxicating liquors, if the religious sentiment lifts him above his troubles and makes him forget his problems and difficulties more thoroughly than drunkenness can do. But such pathology of religion we shall henceforth ignore.

Let us return, then, to the first of the two endeavors which make up the striving of intelligent religion. It is the endeavor to know God, the value-making process of nature, in which and with which man must work and live in order to attain the best.

We have identified God with the value-making process *of nature*. Immediately we are confronted by the old question of natural and supernatural. Is God one phase of nature or is he outside of and beyond nature? That depends on how great scope we give to the concept of nature. If by nature we mean that which is bounded by the scope of the physical sciences, then God certainly cannot be found in nature because this value-making process is not merely physical and chemical; it is also biological, psychological and sociological. But if by nature we mean that which is not only investigated by the physical sciences but also by biology, psychology, sociology, by every science and by every possible science, and includes, furthermore, those concrete wholes, individualizations or integrations of nature which constitute the particular individual things of daily experience, which may be investigated by all the sciences but never exhaustively explored by them, if nature is understood in this inclusive manner, then God is to be sought in nature and nowhere else. He is a process of nature as truly as a human mind or a human culture is a process of nature, although he is a process more inclusive than one of the individual minds which participate in it. If by nature we mean everything which conforms to natural law,

whether the law be known or unknown, then God is to be sought in nature, as one of its phases. If by nature we mean the total organic system of order in which we live and move and have our being, then God must be sought in nature. With this understanding of nature God is a process of nature as truly as the loves and aspirations of human life, as truly as our developing ideals and arts and sciences. So we conclude that God *is* the value-making process *of nature.*

Can we state more specifically what this value-making process of nature is? To do so in any adequate manner would plunge us into all the complexities of the theory of value which is so very unsettled at the present time. What constitutes value? How is value sustained, created, magnified? These questions should be answered in making any statement of the value-making process of nature. But we have not space to deal with the intricacies of this problem except in a very summary and arbitrary manner.

The value-making process of nature we shall call progressive integration. Integration at the biological level is represented by health, while disease is disintegration. At the mental level integration is that systematic consistency of organized experience, which is called truth, while error is disintegration of experience or inconsistency. (By consistency we mean here not only logical consistency but also consistency between calculation of outcome and actual outcome in any experiental operation such as observation, experiment, or mere anticipatory behavior). Any instance of beauty is integration at the aesthetic level, while ugliness is disintegration in the aesthetic phase of experience. At the social level integration is represented by love, friendliness, cooperation, goodwill, sympathy, and the like. Integration is found at lower levels than the living organism. It appears in that

integration of electrons called the atom, and in the molecule, as well as in the living cell, the mind, the group, or any historic culture with its arts and sciences.

For sake of simplicity we have illustrated integration before defining it. We mean by it something which has been expressed with increasing clarity and insistence by a number of thinkers during the last twenty years and more. Jan Smuts calls it Whole-making or Holism; Hobhouse calls it the development of increasing cooperation throughout nature; Whitehead calls it concretion which gradually increases throughout the observed world; Michael Pupin calls it Creative Coordination which is in process of natural development; F. S. C. Northrop calls it the "microscopic atom" which exercises a "congesting influence" throughout nature. Integration is the development of organic wholes or systems.

The process of *progressive* integration is that change of integrations which can be observed in which the integrations become more inclusive and more richly compacted of content. We might say that progressive integration is the increase of congestion on the part of organic wholes, providing we do not associate the word congestion with evil; for this increase of congestion is precisely increase of value. It is not a congestion involving mere increase in disorganized complexity, but it is an organic growth in which all the combined elements and activities enter into more intimate mutuality, more mutual support and enhancement. Our illustrations, we hope, will have served to make this plain. It is the increase of individualization.

This increase in the richness of integration which we call progressive integration proceeds by way of the interaction of organic systems upon one another. These interacting organic wholes may be regarded as components of a larger, more inclusive organic system, or they may be

regarded as distinct systems. How they are regarded in this respect is largely a matter of view-point. For example the growth of a multicellular organism is an example of progressive integration, for the growth is not only increase in size but also increase in the complexity and intimacy of interdependence among the various parts and activities of the organism. This increase may be viewed as proceeding from interaction between organic parts of the organism, each part regarded as a whole. Or the process may be viewed as going on within the whole inclusive organism, the interaction being between its parts. Still again one may consider the interaction as between the organism as one organic whole, and various environmental objects, such as food, air, and the like, which are other organic wholes. Or again, which is perhaps the more adequate view, the organism may be regarded as one organic part of a larger whole, this larger whole consisting of the environment in the form of food, air, sunshine, other organisms, etc.

This kind of interaction between organic unities, giving rise to richer integrations, is not the only change we observe in nature. There is also the interaction which gives rise to disintegration or breaking down of achieved organic unities, where the intimacy and complexity of mutual support is diminished. There is also the kind of interaction which neither increases nor diminishes the richness of integration in any achieved unity, but simply hardens or crystallizes some system of organization so that it becomes incapable of further development. This is perhaps the basic evil, the evil of disintegration being merely the result of interaction between some uncrystallized unity and one that is crystallized. Creative coordination cannot proceed out of such interaction because of the static

hardness which has come over some one or more of the interacting systems.

Excepting where this static hardness or crystallization has supervened, we may say in general that the greater the number and diversity of relations between individuals, the richer will be the integrations arising out of their interaction and the more rapid will be the development of these richer integrations. It is some such idea as this which is set forth by John Dewey in his paper on *The Social as Category.*[2] While he speaks of the social as category, he makes it plain that this category is descriptive of an existential situation and process. At the level of human society we see the most elaborate system of interactions between individuals, not merely human individuals, but also subhuman and subvital. Stones and clods and rivers and coal beds and everything else in nature becomes involved more or less in this multiplication of interrelations which appears in human society. Furthermore, this multiple interaction of individuals human and subhuman, vital and subvital, increases with advancing culture. Hence value and progressive integration reach their maximum in human society. But it is also true that the most devastating disintegration or evil appears in highly developed societies, due to the delicate balance and great complexity of these humanly social integrations together with the static hardness or crystallization which some of them undergo, making them the destroyers of more plastic and growing integrations. This danger and this evil increases with advancing culture. But that fact does not contradict the other truth, that at the level of human social life we find the richest integrations, the greatest values, and the fullest manifestation of that constitutional tendency of nature called progressive integration.

[2] See *The Monist*, Vol. XXXVIII, April, 1928.

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This value-making process of nature we call God. For God is a term which has always been used to designate the value-making reality with which and in which man must live for salvation, however diverse may have been men's ideas of what the nature of this reality was. This progressive integration is one constitutional tendency of the universe. When we say it is constitutional we mean it is wrought into the very nature of things. So far as we can see it is as indestructible and as inescapable as any other tendency of the universe. Certain integrations may be destroyed; certain local processes of increasing integration may be obstructed or crystallized or even eradicated. But the process always springs up somewhere else. It is, we say, a constitutional tendency of the universe.

One may have all sorts of "over-beliefs" about this constitutional tendency of nature. One may say that there is something "back of" nature, which makes nature display this characteristic. He may say that this universal tendency is but the phenomenal expression of some noumenal "Power." He may say that God is a trandscendent Personality and this progressive integration is his working upon nature from without. All such noumenal, transcendent Realities, Powers, Personalities, are ineluctably beyond the reach of investigation. They can be neither proved nor disproved. They are matters of speculation and in the nature of the case can be nothing else. All who wish are welcome to them *providing* they do not allow these beliefs to interfere with the two essential endeavors of all intelligent religion, namely, (1) to attain the most adequate knowledge of the value-making process of nature and, (2) establish the most value-making association of human life with this process.

These over-beliefs may be, and often have been, cherished and propagated in such a way as to destroy

the very factual basis upon which all intelligent religion must rest. When that is done religion is eating out its own heart. That is the great danger of these speculative over-beliefs. Precisely because their validity cannot be investigated they tend to become rigid dogmas which dull and obstruct the use of intelligence in the twofold endeavor which constitutes the essential heart of intelligent religion. Sometimes they not only dull and obstruct, they become aggressively destructive of the conditions, mental attitudes and instrumentalities of all intelligent living. Nevertheless, while they are always dangerous and often positively evil, man is born to them as the sparks fly upward and so they will probably always be a part of human life, richly exfoliating not only in religion, for religion is by no means the only place where they flourish. They are also to be found in rich abundance in science, philosophy, art and love. In fact they are probably the creatures of the artistic, philosophical, scientific and affectional impulses of man quite as much as of his religious impulses. If man could cease to be artistic and philosophical and scientific and affectionate, he probably would scarcely be religious either, for these all spring out of a common root in human nature. But if he could be religious without these, his religion would not have all this overgrowth of dogma and speculation. On the other hand, however, it is theoretically possible to be artistic, affectionate, philosophical, scientific and religious, without insisting on the truth of speculations which cannot be investigated and tested, however one may imaginatively construct them. This way of human living is not only theoretically possible, it can be approached more or less. This tentative or even agnostic attitude toward speculative and imaginative over-beliefs is neces-

sary, we believe, if we are to have a healthy, vigorous, constructive religion.

We have said that God in the one essential feature of his being, namely his value-making characteristic, is an observable event. We can observe God just as we can observe other existential realities. It is true it is not easy to observe a rich concrete whole. Only in profoundly aesthetic experiences, especially where love is dominant, and in a certain kind of mystic experience, do we begin to approach any full consciousness of the rich concrete fulness of an individual. Perhaps it is even more difficult to observe that change of an individual by which it becomes more richly compacted of organized content, to which we have given the name of progressive integration. And yet it is possible in some measure to observe the concrete individual and its progressive integration. Capacity for this kind of observation can be vastly increased by cultivation and the right way of living.

Can God, so conceived, be an object of scientific investigation? That question cannot be answered by a simple unqualified statement. Our first reply must be, No. Science is equipped only to cognize uniformities, and uniformities are never concrete individuals. A uniformity is merely an abstract characteristic which enters in as one constituent into the concrete fulness of an individual. Science may discover many different uniformities, all entering in as components to make up a concrete individual; but there are always a great number, perhaps an infinity, of other constituents, which are also components of the same individual thing. However, the different sciences differ greatly in their capacity to approach the concrete individual. Physics is least fitted, for it deals with the most abstract and meager of the uniformities of nature. Biology approaches the individual much more closely.

Psychology is scarcely yet sufficiently stabilized to know just what it can do, but it would seem that it will be able when more fully developed, if not already, to cognize complexes of characteristics which come closer to the developing individual. It may be that sometime sociology will be able to go farther still in this direction. And in the future other sciences may be developed which will be able to advance still farther toward cognition of progressive integration as it proceeds in nature.

We have just been saying that science cannot give us knowledge of concrete wholes nor of their growth in concretion. In one sense that is true. But in another sense it is not. In one sense science *can* give us knowledge of concrete individuals and progressive integration. While it is true that science can only formulate and test theories about abstract uniformities, it must search for these uniformities in concrete individuals, for they can be found nowhere else. Also when we know a uniformity, especially when we know a rich complex of uniformities which determine certain essential relations between the individual and other individuals, we can use these uniformities to enter into rich immediate experience of the individual, to vary this experience at our will, and to experience the increasingly rich content of the individual if it displays progressive integration. When we can thus use known uniformities as guides and instruments for entering into most complete conscious experience of concrete wholes, it can be said that these uniformities then give us knowledge of individuals and of progressive integration in the only way in which knowledge of such events is possible. In this way science with its knowledge and other products can become a cooperator with religion and the practical arts in leading human life into the greatest values. Also

in this way and with this radical reservation science can be used as a means of knowing God.

But it must be emphasized that what we have just described is a *use* of science and of scientific knowledge by religion and the practical arts. It is not a consequence which will automatically follow when science is fostered and magnified. This knowledge of the individual and of progressive integration, and the adjustment of human life to these in such a way as to attain the great values of existence, does not inhere in science apart from religion and the arts. The uniformities which science has thus far brought to light can be used to enter into rich experience of individuals and to associate human life with progressive integration only to a very limited degree. Our religious technique and the technique of the arts has not kept pace with the advance of science. For this reason we cannot take the uniformities revealed by science and use them for the enrichment of human life. So the good of science is still-born; it dies before it lives. And for this reason also science does not enable us to know God. This is not the fault of science, but the fault of religion and the arts insofar as they have not mastered the technique for making proper use of science.

Insofar as science is not counterbalanced by religion and the arts, the abstractions which it magnifies, by focusing attention upon uniformities to the exclusion of individuals, prevents us from having any awareness of concrete individuals and their progressive enrichment in which all value is to be found. Thus science becomes a barrier to all immediate apprehension of the good of existence and of God and shuts us out in a barren and impoverished region where we wander amid practical and theoretical utilities which lead nowhere. This is the inevitable effect of science upon human life, casting a

blight over the whole of civilization, when religion does not keep pace with science and apply our scientific knowledge of uniformities to the work of reconstructing human life in adaptation to individuals and the integrating process so that man can experience the great values. To turn scientific knowledge to this use is the chief task of religion and philosophy in the world today. Philosophy must do the theoretical work and religion must develop the technique by which to apply this theory in the conduct of living and immediate experience.

So we conclude that scientific knowledge can be used by the religious man and the religious group to attain a better knowledge of progressive integration, the value-making process of nature,, and also to enter into better living association with this process. This, according to our definition, is precisely the twofold endeavor which constitutes religion. Worship, of the sort we have in mind, is the technique by which this is done. It is simply the method by which the solitary individual and the group endeavor to establish those habits and mental attitudes by which they can enter into fullest experience of concrete wholes and participate most fully in the progressive integration of nature. Through worship men try to become personally equipped to maintain such relations with other men and with things so that beauty, aesthetic appreciation, love, cooperation, good will, sympathy, mutual understanding can arise. In a word, through worship they try to become equipped to establish those relations which will release the integrating process of nature and thus bring forth the great values of existence.

It should be pointed out that worship itself does not and never can create love, cooperation, good will, sympathy, mutual understanding, beauty and profound aesthetic appreciations. These goods, when attained, are

objective products of the integrating process of nature. They are created and sustained by God. All man can do is to enter into those relations or establish those forms of interaction between individuals, through which the constitutional tendency of the universe can fulfill itself in further and richer integrations. The case is analogous to that of a farmer raising a crop. The farmer cannot make the crop grow. All he can do is to put the seed in most favorable relations with soil, moisture, heat and sunshine and out of the interaction between these individuals that form of integration called a crop must develop. So also a man cannot make himself love or make another love. What he can do is to enter into those relations and forms of interaction out of which love develops because of the constitutional tendency of nature to achieve such integrations when such relations are established. The same is true of beauty and aesthetic appreciation and mutual understanding and good will.

Therefore the work of worship is not "subjective" in the vicious sense. To be sure worship requires subjective readjustment of personality. But the good that is sought and attained through worship is the objective work of God. Worship simply puts the individual in right relations with God and with other concrete wholes so that progressive integration can fulfill itself.

It is true that conventional public worship is sometimes almost ridiculously inept to this end. Often it becomes a mere form or is diverted to other ends altogether. Nevertheless the great religious personalities of history have practiced worship to this end, and it is they who must reveal to us what is the true nature and function of worship.

A careful study of this kind of worship we cannot

here undertake.[3] We can only state a little more fully what it undertakes to do. The worshiper endeavors to view some major problem, in the most comprehensive and perspicacious manner; also to examine himself in the same manner to discover what readjustment of mental attitude and habit he should establish in himself in order to make those connections with other organic unities through which the problem can be solved and the desired good attained. This favorable outcome must be, in the sense indicated above, the work of God.

In order to view the problem and the self in the manner indicated it is necessary to free the mind of distorting prejudices, passions, narrow desires and the bias that arises out of too much concern with immediate circumstances. Hence the worshiper must relax. He does this by surrendering himself in trustful passivity to the upholding process of integration which makes him live and keeps him living. He may think of this in terms of organic chemistry, the working of the cells, or the autonomic nervous system, or electric tension, or the total ensemble and interaction of elements composing this planet which sustain and promote life, or in any other way he likes, although the abstractions we have just mentioned are ridiculously inadequate to serve as symbols for that process of integration (God) which sustains and carries the conscious life of man somewhat as a stream sustains and carries a piece of floating wood. In this state of mind he views his problem in a contemplative, yet alert and seeking attitude in which illuminating suggestions are most likely to spring to consciousness. Often they do. In the same unbiased, objective way he examines himself, not exactly from the "standpoint of eternity" but in a way that this phrase may suggest.

[3] See the present writer's *Methods of Private Religious Living*, Macmillan Co., 1929.

If he is successful in this worshipful problem-solving he discovers what readjustment of his own personality is required to get the desired result, the richer integration. Having discovered it and stated it, he may establish it as a permanent, subconscious set of his personality by means of auto-suggestion.

Let us repeat that through such worship he has not attained the desired good in the form of an actual existential achievement. What he has done, if successful, is to attain that reconstruction of personality which will enable him to enter into those relations with other individuals, human and subhuman, which are required in order to allow the progressive integration of nature to fulfil itself. These relations with the human and subhuman must be maintained in the daily life. But in worship he seeks out the ways of God (progressive integration) so that he can live his life in the required relations with his surroundings.

All practical problems wherein some greater good is sought involve one general principle for their solution. This general principle may be described as closing the circuit. That is to say, the desired good can be attained only by bringing individuals in such relation to one another that their interaction will give rise to the required integrative process. The individuals may be coal and water, making steam; or dynamo and waterfall making electricity; or seed and soil, or man and man in brotherly cooperation, or man and woman in sexual intercourse, or Einstein and the Michelson-Morley experiment, or Abraham Lincoln and secession of the southern states. All practical problems are solved in such a way as to yield a desired good only by closing some circuit, i. e., establishing the required relation between organic units. When this is done the constitutional tendency of the universe toward progressive

integration is released and the greater good is brought forth.

It is plain, however, that not all problems require worship for their solution. The greatest number of them do not. But the most important and baffling of them do. We must indicate what kind of problem it is which requires worshipful problem-solving for its solution. It is any problem of such a nature that the required relations between concrete wholes cannot be attained without some reconstruction of the personality. It is plain that such reconstruction cannot be attained without, on the one hand, viewing the problem, and on the other, the self, in such a way as to discover what this reconstruction should be. This often requires the method of worship. Also, even when one knows the habit or mental attitude that he should have, he cannot establish it in his own personality without this method of worship. Again, even if one knows what to do and can do it, he may not be led to do it until he can see the whole matter in that comprehensive way which worship makes possible.

If it be true that the most urgent problem of the present age is to take the uniformities and machines brought forth by science and turn them to the work of promoting individualization and appreciation of concrete wholes, then surely the most urgent task just now pressing upon us is to bring people to understand and induce them to practice the method of problem-solving worship. For this is precisely the method by which the works of science can be turned into the most helpful servant that has ever come to the aid of man. But if some such method is not practiced the achievements of science will become a Frankenstein. Instead of enabling us to enter into immediate experience of the great values, they will do the opposite.

We have correlated religion with the arts. They are

similar in function, yet are different. We must distinguish between religion and the arts.

Religion undertakes to change man and his world in such a way that progressive integration and appreciation of individualization shall reach the maximum in human experience. Fine art plainly does not try to do this. Fine art works within very narrow limits, under carefully protected and artificial conditions.

It has become somewhat the fashion today to claim that fine art should not be limited to the music chamber, the ball room, the theatre and the like, but should prevade the whole of life. That is all very well, but when art is thus made to prevade the whole of life it becomes something very different from fine art in the commonly accepted sense of that word. Art may be spread so far as to become simply the art of living human life at its best. If this becomes sufficiently earnest and truly effective it must undertake the twofold endeavor which according to our definition constitutes religion. In that case art and religion would become identical. Then it would simply become a matter of words which term was used. But that is not the meaning which has traditionally been given to fine art. Nothing is to be gained by spreading the word out in such manner.

The practical arts are much closer to religion than is fine art, if we understand fine art in the ordinary way. The practical arts in diverse ways and degrees undertake to change either the conditions amid which man must live, or man himself, or both, so that the values of human existence may reach the maximum. But the practical arts are not so comprehensive nor so fundamental in this undertaking as is religion. The various departments of human life are farmed out to the several practical arts respectively and each keeps more or less to its own field. Thus politics,

industry, commerce, friendly intercourse and polite society, love and home life, education, and the like, are practical arts more or less developed and distinct, by which we conduct the various phases of our life. But religion is not limited to any one such phase. It endeavors to deal with life as a whole. Furthermore it goes to the bottom of the problem by trying to discover what is the value-making process of the universe and how to associate human life with it in the most helpful manner. Worshipful problem-solving is the most distinctive and effective method which religion can devise for dealing with this problem.

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THE SEARCH FOR THE CONCRETE

PHILOSOPHY throughout its history has been confronted with a paradox. Its special task has been to discover and characterize the concrete; yet its only instrument, thought, is abstract. How by a process of abstraction can we reach the concrete? This is the problem that every philosophical thinker must face. His solution, if he find one, will determine every essential feature of his philosophy. While science is at home amid abstractions and moves easily among activities without raising the question as to what is active, philosophy wins its charter to do business just because it undertakes to find the concrete reality. In the present paper we raise the fundamental questions, what is the concrete reality, and how can it be reached? Let us first pass in review some of the more influential answers of our time.

Many people are sure that the concrete is revealed in sense perception. What could be more concrete than sticks and stones? But as soon as we begin to think about them, we break them into smaller bits, we bulk them together into heaps, we look for the invisible connections, we separate into primary and secondary qualities, we play with the idea of uniformity, of causal connection, of system, of activities, of events. This is thinking about things—a necessary process if we are to know them, yet a movement away from the concrete. Sense objects as ordinarily

understood have no protection against the analyzing intellect. Nothing but the practical exigencies of life can prevent the inquiring mind from dissolving physical objects into a flow or process in which nothing remains long enough to flow. Destructive analysis can be checked at any time by the simple device of ceasing to think. But the realistic philosopher must follow the logic of his initial assumption to the end. Manifestly he cannot by analysis reach the concrete.

An answer introduced into current philosophical discussion by A. N. Whitehead is a revival of two dominant ideas in Leibniz's monadology. Whitehead maintains (1) that events out of which things are made have an organic structure, that is, they are held together by internal relations, and (2) that the time of an event is epochal, that is, time consists of a very small bit of duration endlessly repeated. Events or primary organisms have a coherence that can successfully resist analysis even though they occupy the four-dimensional medium called space-time. On the basis of such events he builds what he considers a thoroughgoing realism.[1] Without attempting here a critical estimate of Whitehead's theory of the objective world, we would point out the failure of these two concepts to give us the independently real or concrete. His primary objects can be organic only by fiat. Not otherwise can they be considered as having any favored position that might shield them from the logical weapons that would destroy them. Whatever is in space can have no claim to the least independence, for space is the principle of externality. The internal relations by which an object becomes an organism point directly to a theoretic construc-

[1] *Principles of Natural Knowledge*, p. 73 ff., 111 f.; *The Concept of Nature*, p. 86; *Science and the Modern World*, pp. 174-180, 186-191; *Proceedings of the Sixth International Congress of Philosophy*, p. 63; *Symbolism*, p. 10. Cf. B. Russell's *Philosophy*, p. 276 ff.

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tion on the part of the observer. A thoroughgoing realism has no right to recognize internal relations.

We become involved again in logical difficulties when we try to interpret realistically the doctrine that time is discontinuous or epochal. This is doubtless as evident to Whitehead as to anyone else. He seems to have tried in his earlier works to construct his objective world out of event-particles considered as points in space and indivisible instants in time. But this effort was foredoomed. The only remaining possibility was to make the event indefinitely small but held together by internal relations and to give it a minimum duration in time. If such an event could be allowed, the building up of an independent world, at least in outline, would be only a matter of elaboration. It is hardly necessary to point out the difficulties that beset the idea of epochal time. The very nature of time seems to preclude such a conception. Time as objectively real is an unmanageable contradiction. It vanishes without remainder unless it is epochal; and if it is assumed to be epochal, the past and the future must coexist, and time becomes meaningless. The theory of epochal time is an intellectual device to save events from disappearing entirely. This is recognized by Whitehead himself.[2] Time and events thus become concrete by grace of an intellectual compromise. In his later works Whitehead supplies a principle of concretion which he calls God. But even thus he cannot guarantee objective reality to things in space and time. Apparent independence we all recognize, but that is the work of ourselves concretizing our experiences in spatio-temporal forms.

But what of space-time, the hyphenated entity that is doing good service in descriptive science? Space and time are evidently abstractions, since neither can exist without

[2] *The Concept of Nature*, p. 57.

the other. An object in space must also have duration in order to exist at all. Why not, then, make space-time the primordial continuum from which all existences emerge? As such it would be the very quintessence of the concrete and the real. This seems on the face of it quite in harmony with science, for it would mean deriving the complex from the simple—a process recognized in descriptive science as legitimate because practically useful. It is the method employed when biological chart-drawing is the task in hand. But we hardly need remark that the procedure is abstract. It is the arrangement of abstractions in such an order as will display, when we pass from one member to the next, the minimum of additional complexity. This is evolution as understood by science when it excludes all theory as to what evolves. When however it is taken as an attempt to account for the emerged complexities in the series, it is logically impotent even to get under way. The complex may cover the simple, but not vice versa. When, moreover, we reflect that present experience must necessarily be our starting-point and whatever is put into the past is pure inference from the present, just as what is anticipated has its roots in the present, we see that on strictly empirical grounds, space-time is an abstraction from the totality of present experiences. Yet S. Alexander in his *Space, Time and Deity* is sure that in space-time the ultimately concrete is revealed. Nothing in recent philosophy is more interesting than the amount of concrete reality that Alexander draws out of space-time. With the skill of a sleight-of-hand artist he finds in what supposedly is only space-time a world of realities with deity as the most real. Since all that he draws out of space-time must be there to draw out, we may conclude that space-time is his name for the evolving universe including deity. He has not met the criticisms against space and

time as concrete elements in a real world. Space remains space, and time remains time, and when combined they are still abstractions. Space-time may be useful, like the bracketing term fruit when we wish to add apples and pears; but in its use we are going away from not toward reality.

Another realistic conception of the concrete is Santayana's doctrine of essences.[3] This doctrine is so clothed with imagery and gorgeous verbiage that it is difficult to X-ray. If a literal statement may be hazarded, Santayana's essence seems to be that which is left in the analysis of a sense object when we eliminate complexity and structure and duration and all that can possibly be construed as consciousness. The essence in its immediacy is gone before we begin to think about it, and is replaced by another essence. These instantaneous glimpses, according to Santayana, disclose a realm of independent eternal essences. But here the essences are ghosts of pure being, and as such are figments of the imagination. That they have other than imaginative reality is not proved. In fact, the only reason suggested is the feeling that something must be out there or we are absolute shut-ins without any world whatever except our own subjective fancies. If there must be something external to our own subjectively originated world, what could be more plausible than that this something is revealed by the instantaneous opening and closing of our human kodak shutter? These essences as they appear to us are, then, in Santayana's scheme, but glimpses of unchanging entities in an independent world.

A destructive criticism of this conception of the really concrete is so easy and evident that we hesitate to suggest it as actually disposing of Santayana's basic premise.

[3] *Scepticism and Animal Faith*, p. 67 ff.; *The Realm of Essences*, p. 1 ff., 93.

The conviction that something other than ourselves exists and is in continuous contact with us is ineradicable. Every experience supports the conviction. But there are at least two ways of locating that independent something. We may look for it in or behind the sense object, as do realists generally; or we may simply recognize the fact of control as exerted upon us in sense perception and waive all reference to space-filling entities. The first gives us logically a static world. The second stops short of affirming anything other than that the controlling power controls; that is, the independent reality declares itself in its activity, it is purely dynamic. The first theory fails at every point to explain the facts for which it was invented, except in so far as it can be assimilated to the second theory. When the process of assimilation takes place, all the objective sense features drop away, and the second theory remains as the only tenable conception. Evidently we cannot identify the concrete with Santayana's essences, either as instantaneous revealing flashes or as a changeless world of entities.

The elaborate effort of Bertrand Russell in his recent books[4] to mediate between Berkeleian idealism and the various types of materialism has issued in a revival of the theory that the concrete reality is a neutral stuff. He calls his philosophy Neutral Monism. Here is not the place to pass in review his entire system of thought; our interest is solely in what for him constitutes the concretely real. He feels the philosophic urge to reach somehow a monistic view of the world. But he sees plainly that he must face the fact that the supposedly mental order and the physical order contrast in many and apparently essential particulars. Neither is the other, though neither can get on without the other. The physical order is revealed in sense perception which involves memory, imagination,

[4] *Analysis of Matter*, p. 382 ff.; *Philosophy*, p. 279 ff.

and a modicum of feeling, not to mention rational correlations. But these apparently mental functionings are all directly connected with a mind that is presumably nothing but their sum; or better, with a brain which is simply a collective term for activities into which an analysis can resolve perception. Look in the direction of perceptive functioning and you see the physical; look in the direction of objective things and you find unmistakable evidence of mental activities. Thus Russell succumbs to the temptation to reduce the psychophysical contrasts by putting the percept into the physical world and the physical qualities into the mental world and calling the result neutral. But this device, tried often by Russell's predecessors, fails as inevitably as heretofore. No skill in mathematics nor in marshalling the newest ideas in physics can save such neutrality. It marks, however, a real advance over ordinary materialism in that it points out a goal not yet reached. But when taken as the attained goal, the final stopping-place of thought, it has all the weaknesses of materialism without the popular advantage of taking sense objects in their most obvious character as independently real. Russell, in all his intricate expositions, assumes what he calls energy, a something that manifests itself through events, mental and physical alike. What we call things are for him strings of events, held together when physical by causal connections and when mental by mnemic connections that act as if causal. This energy, when closely examined, turns out to be merely a general term referring to the activity of events in connection. Whenever physical concepts are critically considered by Russell, they pass out of the physical realm altogether and leave nothing as the source of the physical except the laws that express the form or manner of the activities themselves. So it is also with mental events. They are

resolved without remainder into laws, though the laws in the case of the mental are far from being as definite as the laws of the physical. This neutral monism yields a complex of abstractions to which, on occasion and for practical purposes, terms expressive of concrete realities can be applied. It faces both ways—toward materialism such as physicists are abandoning, and toward personal idealism which to Russell is anathema. But nowhere in it is found the concretely real.

An old view of the concrete is coming into vogue again, and is set forth persuasively by H. Wildon Carr. "In the concept of life," he says, "we have the concept of a concrete existence such as no other principle supplies. Life in its full meaning includes materiality and mentality, and no other concept does. As studied in biology it is an abstract concept like the concept of magnetism or of electricity, a class name for a group of particular phenomena, but to philosophy it offers the basis of a metaphysical construction. The concept of an inexhaustible activity manifesting itself in a process of creative evolution enables us to conceive an all-embracing dynamic reality."[5]

We have sought the concrete in the material universe, in the neutral zone, in the realm of the non-existent essences, and now we seek it in what seems to be the source of all the various types—life itself. But life is a general term for living organisms. To make it concrete one must give it particularity, individuality, definiteness. There is hardly an abstraction in the arsenal of intellectual constructs more vague and indefinite than life. It is not a neutral something, not a lumpish material, not an event, nor a series of events; yet it makes all things what they are by its presence. That is, it somehow *becomes* them and it becomes whatever they change into. If one wanted

[5] *Changing Backgrounds in Religion and Ethics*, p. 82 f.

to know the origin of anything living or non-living the sufficient answer, according to this view, would be, It originates in that primordial essence which we call life; it expresses a form of life. But manifestly such a statement helps very little to insight. What more is there to it, as it stands, than the statement that all things originate in something that is something else, something that is and at the same time is not that which originates in it? The theory in the hands of Carr seems to have great powers of explaining experience, but that is because he puts more content into his concept of life than the general notion can carry. In his scheme of thought life becomes almost identical with the neutral stuff of Russell, and is open to the same strictures. But it has the advantage of accentuating the active principle in reality and of eliminating the otiose. It also—and this is its chief interest to us at present—points the way to a more satisfactory conception of the concrete than any we have passed in review.

May it not be that in order to find the concrete we must have more definitely in mind just what we are looking for? What makes anything concrete? What characteristics must it have? We may confidently assert, first, that the concrete must have duration or it would disappear before it could be apprehended. It must also have a unity that defies dissolution. This does not mean that the unitary thing must be utterly simple (non-complex), for the simple is the opposite of the concrete, it is a limiting concept which abstracting thought can approach but never reach. A concrete unity must have an internal structure that makes it a unique whole, a whole that would cease to be what it is if taken apart. This requirement is so elemental that we are apt to assume it without appreciating how basic it really is. Some sort of unity is the starting point as well as the goal of every

thought and every sense experience, however unreflective. The concrete, then, must be a complex unity. A third requirement, following from the two just mentioned and giving them force, as it were, is that the concrete must be active in producing results of some sort, or else it would fail to manifest itself. In this requirement we touch the sensitive nerve of philosophic thought—the real or concrete must be active. In being active it must maintain its integrity throughout the changing forms of its activity. These characteristics—durability, unity, activity—are the absolute minimum to be affirmed of anything that we can call concrete.

What, then, can endure in its own right or as the expression of its own nature? A negative answer is near at hand: Nothing can endure that has not a memory. Endurance means transcendence of the present, a building of the past into the present as an actual part of its structure. The past thus exists only representatively, as a phase of present experience, and is possible only as that which remembers actually constructs its past as well as the time in which its past is located.

This conclusion seems inevitable, yet it carries such consequences for philosophy that the most persistent and elaborate efforts are being made to avoid it. None of these efforts excel in subtlety and ingenuity of reasoning the theory of Santayana already considered. In his work, *The Realm of Essences*,[6] he expounds the doctrine that reality includes an infinite variety of absolutely definite, isolated, changeless, eternal entities that are not mental, not physical, and not existent, yet real in a superlative sense. In contrast with this eternal realm, the world of existence is evanescent, ever changing, with only borrowed reality. Its coming and going consists in our

[6] P. 18 ff.

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passing from one eternal essence to another. That an essence should for an instant pass into existence is a very small matter, since it is in no way affected thereby. An essence does not need memory, it eternally is.

Such a theory is difficult to criticise, because we can know directly nothing about the essences until they enter into consciousness as experiences, and then they evidently are subject to the laws of change. The realm of hidden essences can easily be accounted for psychologically, even if no way is found to justify a belief in it. We need only reflect that thought content as such does not change (that is, the law of identity holds for thought considered as content), that all the elements of a thought complex are equally changeless, equally disparate, equally real, and that their appearance as aspects of experience in no way modifies their nature as thought—we have only to reflect on these well-known features of our mental life to find all the material for Santayana's theory. If we further make the assumption that every distinguishable element of actual or possible experience is eternally and changelessly real, the mysterious realm of essences is provided for. But it is quite another thing to justify such a piece of picture thinking. The argument is simple, and runs substantially as follows:—Experienceable things must be real as possibilities, else how could they ever enter into experience and exist for consciousness? If in the realm of the possible they eternally are, they must be infinite in variety, changeless, and definite. Thus we seem to avoid all reference to the construction of the thing-world in the act of experiencing it. But do we?

Nothing in our experience is more evident than the fact of change. Every object is ceaselessly passing into something else, time holds sway, and whatever exists continues across a span of time only as it is continuously

renewed. To set over against this changing world another of changeless essences is not to explain the world we know, but to confuse the issues and multiply difficulties. We may conclude, then, that duration can be ascribed only to what can remember, that is, what can construct its past and recognize it as its own. This conclusion leaves on one side many questions that may be raised concerning the antecedents of the act of remembering, the physical mechanism that seems to be utilized, and the possibility of validating the memory experience. Our sole interest is in calling attention to what seems to be all but self-evident—that the act of remembering is in the present, and hence the content as remembered, though past, is compresent with the now of existence. This granted, it follows that the past is throughout ideal and has literally no existence whatever except as it is produced in the act of remembering. Strange that these elementary insights must be so often insisted upon. Perhaps people shy away from them because they involve conclusions that are so revolutionary. But if they are the truth, we need not be alarmed about consequences. There is, then, not the slightest reason for holding that anything without memory, or the power to produce in the now an ideal past, can exist for an instant, much less endure across an appreciable lapse of time. No wonder that Whitehead, referring to Alexander, says that "if time be taken seriously, no concrete entity can change. It can only be superseded."[7] And we may add that the supersession takes place the instant the entity comes into being and that its continuity is a product of intellectual manipulation. Whitehead, conceiving of the ultimately concrete element in the physical world as an event (or "occasion") with the characteristics of supersession, pre-

[7] *Proceedings of the Sixth International Congress of Philosophy*, p. 59.

hension, and incompleteness, has really a mental construct which he as thinker relates to preceding and succeeding events, and to which he gives a definite structure that survives change. This is equivalent to endowing events with what he calls physical memory.[8] But memory as the act of referring a part of a present content of experience to a past constructed to contain it cannot be physical, unless by the physical we mean a thinker. If we do mean this, then the event that through physical memory becomes for Whitehead immortal is the thinker who knows his past and anticipates his future. Such an event has prehension, of course, for it maintains itself while acting in various ways. But such an event (or thinker) cannot be a part of the external world supposed to be revealed in sense perception; for in that world, whenever anything seems to change, it is simply replaced by something else, and the synthesis into things is entirely mental, the work of the observer. The thing endures only as the observer connects it with what preceded and what follows.

Just as we must conclude that the concrete in its own right, that is, the concrete entity which is not a mere ideal construction, cannot exist anywhere unless endowed with the power to remember, so we can by a simple and familiar line of thought argue that such a concrete reality must be a complex unity having internal relations that defy the analyzing intellect. It must be able to act as a unit that may not be broken down or disturbed by the multiple forms of its activity. But an entity that maintains its integrity cannot be a mere thing in a spatio-temporal world. It must be a power whose activities are expressed in the spatio-temporal form.

Thus from whatever angle we view the concrete it

[8] *Ibid.*, p. 62.

takes on the characteristics of selfhood. Only a self can endure through its experiences and maintain its unity while acting in various ways.

Objections may be urged against this conclusion. The self, we hear, is just as much a construction as are physical objects, and is far more difficult to characterize. The appeal to the self seems an appeal to the mystical. This objection, which is in harmony with ordinary common sense, harbors a mischievous confusion. It implies that, to exist, the self must be a spatio-temporal object, one of its own constructs. But the self cannot be experienced in the way we experience the outside world, if indeed it can be experienced at all as it really is. It would hardly be a self if it could; it would be forsooth its own construct, and its reality would represent the activity of another self. We know the self by what it does—as creatively active, as aware of its world, and as working its will under limitations in that world. But representations of the self such as would make it a part of the spatio-temporal world are thoroughly misleading. It is misleading also to call the self a spiritual substance, as if the term spiritual set it off in a mysterious world of non-spatial, non-temporal entities, concerning which we can say only that they have none of the characteristics of experienceable objects. The value of the term "substance" in this connection is largely negative. As applied to physical objects the term takes all its meaning from the achievement of the self in tying its own successive incipient experiences ("events" in the terminology of physics) together and literally injecting into them thus bound together an active principle that is supposed to determine the way they act with reference to their environment. The self is not a substance in this sense. It is not an imputed energy. If we pass in review the other

recognized characterizations of the self, we shall find them either too ambiguous or too vague to be of service. We might well despair of characterizing the self in any way but for the fact that selves are what we are, and all our experiences express ourselves. We may hope that in due time a terminology will be elaborated which can carry meanings unambiguously with reference to the self.

Another objection, or rather, an excuse for ignoring the conclusion that the self alone is concrete in its own right, is that the view seems unfruitful for research. This criticism is valid if by research we mean the study of the physical world as objective and independent of the self. Scientific description may be carried out in detail and natural laws formulated without reference to the self. But as soon as one becomes interested in the substantiality of objects and wishes to know the real nature of things, the way of insight is the way of selfhood. This is illustrated by the puzzles and confusions that beset practically every science from physics to psychology when their conclusions are translated into terms of actual experience. The physicist, for example, in interpreting his pointer-readings and formulae as applying to the world about us, must transform time into something other than time to make it remain long enough to be utilized by him. He must deny the real past and future in order to get a present, and then invent a timeless past and future as constituting his present. Space must be treated as one and many, as continuous and discontinuous on the same level of thought. Things vanish into activities in which nothing is active. The case is the same with the other sciences, except that as we pass onward to the biological and humanistic sciences, each adds its characteristic quota to the confusions. These sweeping statements do not

affect the validity of scientific conclusions for scientific purposes. The reasonings and formulae serve as an effective apparatus for manipulating the objects of experience. But when the apparatus, however completely elaborated, is taken as the concretely real, manifest difficulties arise. We face a dilemma—Either the results of exact scientific thinking must give us concrete reality, or that reality is unknowable. Scientific truth interpreted realistically leads into Huxley's wild and tangled forest of bewildering confusions.

How does the way of selfhood help us? It clears away the confusions, validates the procedure of the sciences, and enables us to set our world in order. We need to recognize and apply in a thoroughgoing way the principle of organization that flows directly from selfhood, namely, that *all objects of experience, animate and inanimate, express the nature of the self up to the limit of their capacity.* In this principle we have the master key that unlocks the doors to a consistent and satisfactory world-view.

The secret of the alluring concreteness of sense objects is now clear to us. They have a derived concreteness. The self makes its objects concrete for its own use. It builds them up, gives them stability, content, spatiality, unity. It makes them seem to be self-active and able to maintain themselves as substantial things. They are concrete by the authority of selfhood and as the expression of the self's constructive power. We have a habit of personifying—finding a man in the moon and picturing Father Time with his hourglass and scythe—but the attribution of selfhood to our objects is far more complete and inevitable than this. A casual inanimate object like a stone by the wayside is thought of by us as a center of

activity. Something in it holds its parts together and carries it as a whole along through time, gives them coherence and duration. What is it that transforms the physicist's raw material—the succession or continuum of events—into a substantial object? What gives the continuum the power to resist, to change under the influence of the environment, to persist in a state of motion or rest until interfered with from without, in short, what makes it a stone rather than a mere succession? The only answer that does not involve a logical tangle is that the power in the stone which gives it its nature is selfhood attributed to it by us in such measure as can be expressed within the limits of the event-series. Here we recognize in its simplest form the concrete universal; it is the concrete usable. Our world of material things would vanish into a succession of events or occasions if it were not for this provision in our mental economy. The recognition of our principle is all that is necessary to make Whitehead's realism quite acceptable—as Whitehead vaguely suggests in more than one passage. The view that time is epochal derives its plausibility from the transfer of the specious present to an objective world considered for the time being as independent. That events are primary organisms with internal relations would be a satisfactory characterization of sense objects considered as our constructive response to stimulations. As such they would be values and nothing else, that is, they would exist so long as they held our attention and no longer.

We may make room, then, for two types of the concrete. We can dispense with neither. One is the self, the originator, and the other is whatever the self is sufficiently interested in to think about, that is, whatever is for the self a value. In the sphere of productive activity where

experience originates, the self meets the requirements of the concrete. It produces experiences in all their detail, in their changes, in their connections, in their wholeness. Hence it must maintain itself through all its changing experiences. It must be an inherent unity, for the experience world that it originates is susceptible of being made into a connected whole. Breathe into Santayana's essences the breath of causal productivity, and they change from abstractions into living realities.

By a similar line of reasoning we may conclude that the power-not-the-self which controls the self in sense perception is the ultimately concrete and ultimately permanent. The fundamental realities on which philosophy may build are the self and, cooperating with it, the ultimate power. Carr's conception of life is the intellectual image of a self.

What, then, of the paradox with which we started? How by intellection can we find the concrete? When once we recognize that the self alone is concrete in its own right, we are free to see in what the self constructs a derived concreteness which will satisfy all the demands of science and common sense. For whatever the mind constructs is necessarily a complex unity enduring through time. All objects of all thought are concrete in this sense when taken in their immediacy. It is only when we relate them to one another that they take on the appearance of abstractions, for then they seem to be parts of a larger whole. But every entity considered by itself is concrete, whether it be an electron or a universe. We make it concrete by a process of ignoring. The concrete may have more or less thought-content, that is, it may be the product of thought to any degree of elaboration without prejudice to its concreteness. Thought by its abstracting pro-

cess is continuously winning for itself new realms of the concrete.

In all this work of concretion we see the triumph of thought concealing itself in its own product. The ruling motif is aesthetic appreciation. The concrete is the appreciated—essentially an aesthetic creation.

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SENSIBLE APPEARANCES, SENSE-DATA, AND SENSATIONS

I

THE transmission theories of light, heat, and sound have so conditioned the philosophic outlook, that the task of laying bare the assumptions to which they gave rise is not yet accomplished. Professor Whitehead, and other realists, have discovered in what way the secondary qualities have been thrust out of the natural world, while bits of matter possessing the primary qualities have been "simply located" in a Euclidean space; and their protest against such a bifurcation of nature is accepted by many. Given such a bifurcation, the most obvious theory of sense-perception was the doctrine of representative perception—the theory that on the stimulation of a sense organ by ether waves from the object, and subsequent excitation of the cerebrum, the mind constructs for itself some sort of psychical entity, "idea," or sensation, which contains all given sensible qualities. The entity is "located" in the mind, and if attentive, and not otherwise engaged, the mind is conscious of it. When the nervous system is neither out of order, nor in an abnormal state, stimuli excite it in their proper way, the proper sensations are generated, and perception is veridical. We have an *outer* world of atoms and electrons, containing physical objects and nervous systems as they are described by the scientist, and an *inner* qualita-

tive world of "ideas"; and the relation between these is such that, under normal circumstances, the one is representative of the other. Now an atomistic physics and physiology resulted naturally in an atomistic formulation of this doctrine. Stimulation of an end-organ gives rise—it was conceived—to a new *element* in consciousness, and given a normal condition of the organism, the relation between the stimulus and the psychic entity is *constant*. Belief in such a parallelism, or "constancy hypothesis," was borne out by the individual's everyday experience of the relation of his body to what he perceives. If I touch my body, or bring it into a new relaton with the external world, there is a change in consciousness. This observed fact—which proves, of course, only a correlation of sensory experiences —has probably done more to support atomistic parallelism than is realised. But atomistic parallelism—so it seems to me—is as out of date as 19th century physics, although, like the latter, it still influences the work of philosophers, even where they would, if pressed, reject it. The trend of modern physiology is away from the old view that events in different areas of the nervous system are correlated with different psychical elements;[1] and *Gestalt* psychologists claim definitely to disprove a constant relation between psychic elements and stimuli.[2] In the following[2a] I shall try to show that this constancy hypothesis has influenced modern theories of sense-perception (a) consciously, and (b) unconsciously; to suggest some of the reasons for believing it false; and to indicate a radically different standpoint which would follow its rejection.

Another way of raising the subject to be discussed

[1] *Cf.* Professor Edgell, *Proceedings of the Aristotelian Society*, supplementary volume VI, p. 16.

[2] Possible references are, of course, numerous; but see K. Koffka's article in *Die Philosophie in Ihren Einzelgebieten*, edited by Max Dessoir.

[2a] Read before the Cambridge Moral Science Club, June, 1927.

is to enquire what are the relations between sensible appearances, sense data, and sensations. In modern analyses of sense-perception there have been confusions between these three entities which seem to me to have influenced the theories profoundly, and in some cases to have inspired them. The confusions are a heritage from the 17th century, and closely connected with the constancy hypothesis. What the above terms *denote,* however, is not a matter of controversy. Let me put it again into words before proceeding further.

Sensible appearances are those entities in the perceptual field that we take for physical objects. In ordinary life we seem to be directly aware of books, bodies, trees and motor-cars. We certainly *are* directly aware of appearances of them, by whatever process we have come to be so. These are the objects of "perceptual situations," *whether the situations are veridical or hallucinatory,* and from such situations or "concrete occasions" all perceptual analysis must start.

Sense data must be distinguished from sensible appearances. At this moment I am perceiving an appearance of a motor-car. I perceive an effective entity with intrinsic characters, and individuality. I can also become aware, under certain circumstances, of a coloured patch, or pattern, located at the place of the motor-car. Entities of this kind have been demonstrated by Professor Moore, and called "sense data." If, says Prof. Moore, we consider a normal visual perception of a physical object A we shall find that there is a certain object which we can proceed to "pick out," and about which the following things are true: "(a) that, if we raise the question, we are tempted to suppose it to be identical with the part of A's surface which we are seeing, (b) that we do not, nevertheless, know for certain that it is part of A's sur-

face at all, (c) that it certainly does, in a sense, sensibly appear to us to have certain sensible qualities, though, unless it *is* identical with the part of A's surface which we are seeing, the sense in which it 'sensibly appears' to have them is a different (and more fundamental) one than that in which this part of A's surface sensibly appears to have certain qualities, (d) that, among all the objects which are at the moment in the same sense sensibly appearing to us to have sensible qualities it is the only one which we have the slightest temptation to identify with the part of A's surface which we are seeing."[3]

Professor Moore deals with visual perception only, but a similar account can be given of sense-data in other modes. When we touch a penny, we can become aware of a smooth, cold, sensible object, which we are tempted to identify with the surface of the penny. When we hear a laugh, taste a strawberry, or smell an onion, we can in each case pick out an entity which we are tempted to identify with the sound, taste, or odour, which the object in question makes or has. Thus at the moment I can pick out, from among a mass of noises in my room and in the street, a sound which I am tempted to identify with the throbbing of that car which stands opposite. It is less easy to "pick out" non-visual sense-data, and their boundaries are vaguer, but when we have succeeded in "picking them out," we shall see that the above propositions are true of them. There is no doubt that there are such entities as Professor Moore has indicated, and called "sense-data." They are the objects of inspective situations.

Sensations are mental events, or states, which follow upon the stimulation of a sense organ, being generated by, and correlated with, the resulting nervous excitation.

[3] *Proceedings of the Aristotelian Society*, supplementary volume VI, p. 180 *et seq.*

These entities are hypothetical, whereas the other two are observable.

Now there are—it would appear—two cardinal points in the doctrine of representative perception, and the second is a point in all types of causality theory. One, that what we directly perceive is an idea in the mind; the other, that there is a psychic element, generated by a sensory process, and corresponding (save in abnormal or exceptional cases) with a stimulus element. The first of these tenets has been rejected by the Realists, and the secondary qualities are now again in nature. But belief in the second still lingers; or, at the best, properties that belonged to the sensations of Representative Perceptionists are attributed to sense-data, and so obscure the relation of the latter to sensible appearances. The view taken in this paper is that the constancy hypothesis is false, and that therefore (a) there are no sensations and (b) the relation between sensible appearances and sense-data is what it appears.

II

This view was formulated in part by Mr. H. N. Randle in the July *Mind* for 1922. In the first sentence of this article Mr. Randle defines a sensation as "a hypothetical psychical process corresponding to, or a function of, an elementary physiological process," and he proceeds to argue that there is no introspective evidence for sensations, and that their assumption involves gratuitous difficulties in the genesis of sensible appearances. His exposition suffers from a failure to distinguish introspecting from inspecting or the observing of sense-data. Thus he is led to confuse sensations with the sense-data of inspective situations, and to deny the existence and observability of the latter. He seems, moreover, to be peculiarly un-

skilled in inspecting. In the early part of the paper he asserts that he is unable to see the upper corner of a room as an obtuse angle, and can only learn to draw it by trial and error, and after instruction in the laws of perspective. This must, I think, be contrary to the experience of the majority. True, the power of inspecting angles is only to be acquired gradually and with difficulty, but I find that in the course of time I *have* learned to inspect the angle of a roof, and I now *see* it as obtuse. Similarly I can now see the colours of shadows, which I once perceived as different shades of brown. It seems clear to me that I am not aware of perspective values *when I am perceiving physical objects,* and, in general, that the objective constituents of perceptual situations are other than those of inspective situations, but that I *am* aware of perspective values *when I am* inspecting. There is no doubt whatever that there are sense data, and that I can "pick them out," and be aware of them. But to these sense-data which in realistic theories have superseded sensations as bearers of the secondary and other qualities relative to the bodily sensorium, there still clings the property of being a function of an elementary physiological process. That there is any entity which has this property is what Mr. Randle denies. Hence—and because he fails to distinguish the introspective attitude from the inspective one—he is led on occasions to an apparent denial of the existence of sense-data.[4] In opposition to this we must recognize that sense-data, which include Mr. Randle's "perspective values," are *observable entities.* But this leaves Mr. Randle's main contention unaffected—namely, that there is no psychical element which is a function of a retinal impression, and that we cannot *find* any such entity either by introspection or inspection.

[4] See *Mind, N. S.,* 1922, pp. 284 and 287.

Mr. Randle's antagonist Mr. C. A. Strong—who like the other Critical Realists is anxious to establish the existence of sensations—believed at one time that they could be discovered by introspection,[5] but he has now rejected this view. In his article in *Mind* for January 1926 he refers to it as "the fallacy of observable sensations." "I myself" he writes "have until lately been guilty of this fallacy . . . and shall devote the remainder of this section to exposing it." The actual argument that follows must be quoted, for it shows how unquestioningly Mr. Strong believes that visual sensations are functions of the retinal impression. He considers a case of micropsia beyond the fixation point. Fixate a page of print, then hold and fixate a pen-point midway between the eye and the page; the print will undergo a great diminution in size. There has been no change, writes Mr. Strong, "(such at least is the assumption) in the size of the impression on the retina: the sensation should therefore have remained unaltered in size." He then refers to the varying sizes of the after-image,[6] and concludes that "these considerations suffice to dissipate the illusion that sensations are observable in their true characters." The observed fact, this is the point to be noticed, does not cast doubt on Mr. Strong's belief in the existence of a psychic element corresponding to the retinal impression. His argument briefly is as follows:— there has been no change in the size of the impression on the retina: the sensation should therefore have remained unaltered in size: but we observe a change in size: therefore what we observe is not the

[5] See *A Theory of Knowledge*. Note (pp. xi and x) that Strong does not think that sense-data are objects of perception. The chapter on "Immediate Experience" is based on the most naive assumption of the constancy hypothesis —see especially p. 211.

[6] Mr. Strong also refers to the fact that sensible appearances are relatively larger than their "corresponding sense-data" in proportion to their distance from the observer. But I am not clear as to what bearing this fact has on the observability of sensations.

sensation. And it may be noticed further that it is because there has been no change in the stimulus that a constant retinal image, and physiological process, is assumed. So that we have here an argument in terms of the constancy hypothesis, and for which its assumptions are vital.

What we observe, then, is not a function of a physiological process. Its conditions are complex, and what occurs in the sensory nerves is only one of them. Mr. Randle further maintains that the assumptions of *unobservable* sensations, or bits of sentience, raises difficulties, and explains nothing. Such illusions as the Zöllner pattern, and the Müller-Lyer illusion render it improbable, and it cannot be made consistent with the varying shapes and sizes of an after-sensation. No fixed extensity value can be assigned to the retinal impression in such a case. It is not possible to deal here with the various stock cases of so-called abnormal perceptions which have been cited by theorists on sense-perception from Berkeley to Dr. Broad, but I think it could be shown that in no case does the assumption of a sensation give a satisfactory explanation. I shall refer only to one oft-discussed instance of size-distance illusion, which is dealt with by Mr. Randle in his discussion of the genesis of size-distance percepts. It is the familiar illusion of the enlargement of the moon on the horizon. It is known that the actual size of the moon does not vary, nor does its distance from the earth. Thus it stimulates the same area on the retina whether it is on the horizon or at the zenith. But when it is on the horizon it *looks bigger*. Belief in a constant relation between the size of the retinal impression and that of the perceived entity results in an absurdly fantastic analysis of this "illusion." It is pointed out that the moon on the horizon is seen dim, owing to density of atmosphere; also it is

seen over an intervening space broken up by trees and other objects. Both these circumstances carry the suggestion of distance. The explanation then runs as follows: that "since its distance thus seems greater than when it is high in the sky, we cannot help *judging* that it must be bigger than usual *in order to produce the same retinal impression* . . . and *so* we *see* it as bigger."[7] This seems rather queer; but take into account the fact that the moon on the horizon is often seen *nearer* as well as bigger, and an analysis in terms of sensations looks even queerer. We then have—as Mr. Randle points out—a secondary deception. On account of the apparent distance we *judge* that the moon is bigger than usual "and see it as" bigger and so after all judge "that it is nearer and so *see* it as nearer." This is the labyrinth into which we are landed by the assumptions of the constancy hypothesis; and there are, as Mr. Randle says, no end to such "epicycles of explanation." His own is much simpler. The size of the sensible appearance is not a function of the retinal impression, but of the spatial field, or "perceptual scheme," in which it appears; and the perceived universe is a bigger spatial field horizontally than vertically, because the overarching heaven is seen as a very much flattened dome.

The long-time accepted notion of "sensations," which springs from the same soil as did the belief in "ideas," and which is bound up with the constancy hypothesis, is criticised by Mr. Randle—so it seems to me—with reason and acumen; and he does not make use of any special psychological knowledge or technique. Sensations are quite clearly not observable, and anyone who examines the explanations of every day "illusions" in terms of them will soon become uneasy. Moreover there is now a great body of psychological evidence which condemns a belief in a

[7] *Mind*, 1922, p. 294. Italics mine.

constant relation between stimulus and perceived entity—whether sensation or sense-datum. The term "constancy hypothesis" was—I think—first used by Prof. Koehler. His work, and that of the other contributors to the *Psychologische Forschung,* has demonstrated the fact that there are objective principles which largely determine the formation and characters of primary units in the visual field, and that the operation of these principles cannot be explained by reference to stimulus elements, whether present or past. Many psychologists, I take it,—for example Piéron—who do not accept *Gestalt Theorie* unadulterated, would emphasize the value of the work on the constancy hypothesis. Epistemologists who wish to construct a theory of sense-perception might well consider that work.

III

The Critical Realists apparently have not done so. It has been little more than suggested in the foregoing that the constancy hypothesis is false, but I hope to be able to show clearly that some philosophers accept it. The Critical Realists are among them, and I shall now consider their conception of "bits of sentience," and their explicit arguments for the existence of such. It is easy to give quotations from the Critical Realists which may show that by "sensation," "state of mind," or "bit of sentience," they mean sensation as I have defined it.[8] "As I look off at the field of view," writes Mr. Strong,[9] "there are a hundred objects which are not discriminated, but only form part of the total picture; these objects excite my retina and my brain in exactly the same way as those to which attention is paid, *they can hardly fail therefore to call forth sensations.*"[10] Mr. Drake holds that on the occasion of a

[8] They add that sensations are "in the place where the correlated brain-process goes on." *Mind,* January, 1926, p. 39.

[9] *A Theory of Knowledge,* p. 22.

[10] Italics mine.

cerebral event "the continuous stream of mental events is modified at that moment *by the addition of a sensation element;*"[11] and again that "the cerebral processes vary delicately in response to variations in the physical things affecting them. *So do the mental states* . . . Why this duplication of machinery?"[12] These beliefs lead Mr. Drake to two important doctrines. (1) The identification of mental and cerebral states. He has eight arguments in favour of this identification.[13] The last five do not depend on any form of parallelism, but they carry little weight; the two main arguments are undoubtedly those from the supposed correlation and concomitant variation of cerebral and mental states, and from the belief that both are *"representative"* of the physical object. (2) The doctrine of fusion.[14] Mr. Drake supposes that since the physiological conditions for the apprehension of a simple quality (e. g. colour, or sound) is complex, that there must therefore be a multitude of psychic states corresponding to the physical complexity; his task is to explain the simplicity of the datum, and this the doctrine of fusion purports to do.[15]

What then are the Critical Realists' arguments for the existence of mental states? In *Mind and Its Place in Nature* Mr. Drake has two. In common with the other Critical Realists, he maintains that the hypothesis that there exist mental states whose characters are projected into the external world makes it possible to give an intelligible account of knowing,[16] and that this can be done

[11] *Mind and Its Place in Nature*, p. 82. Italics mine.

[12] *Op. cit.*, p. 83. Italics mine.

[13] *Op. cit.*, pp. 82-89.

[14] *Op. cit.*, pp. 112-113.

[15] The doctrine is Mr. Drake's account of the genesis of secondary qualities, and is of central importance in his monistic ontology.

[16] By "knowing" Mr. Drake means cognising. He gives no account of knowing proper, and does not seem to feel a need to do so.

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in no other way. The account is briefly as follows:—events occur in the cerebrum which are causally conditioned by atoms and electrons in the external world, whereupon the organism adjusts itself with reference to the atoms and electrons, and in so doing projects the inner characters of cerebral states upon them, or *refers* these inner characters to outer space, or *imputes* these inner characters to outer space, or *uses* its psychic states as signs which mean the physical object. Mr. Drake uses all these very different expressions to convey his meaning. Some of the characters he maintains are rightly "referred," "imputed," "used," or "projected." They "hit the mark," and in so far perception is veridical, and the problem of the presence-in-absence of the object known is solved.

Further, it is claimed that this theory—based on the existence of mental states—explains and makes intelligible a great variety of phenomena. This is the Critical Realists' second argument for its acceptance. Of the phenomena adduced by Mr. Drake some can be explained equally well on some theories other than his.[17] The facts which perhaps his theory, and his theory only, can claim to explain are (1) the projection of after-sensations, images, and hallucinations, and (2) the fact, that the further an after-sensation, or image, is projected the larger it becomes. Of these the first is obviously no special difficulty to the Critical Realists, and they are thus in a favoured position. *Granted* their theory of projection, images and hallucinations are easily dealt with. They are the result of *internally* conditioned mental states which cause the organism to adjust itself to an external object which is not there, and so to project the inner characters of the mental states in the ordinary way. The enlargement

[17] Thus the difference in the time of a physical event and the time of its appearance to consciousness is only troublesome to naive realists.

of projections in proportion to the distance of projection seems to the Critical Realists equally intelligible on their theory. Mr. Strong explains how, as the mental states are projected "like very fine birdshot, a larger and larger surface according to the distance would be peppered over."[18] We are to think of a shot gun, or a search-light. Now the intelligibility of these explanations depends entirely on the metaphor of projection, and I do not think that projection can be regarded as anything more than a metaphor. Nor, indeed, do the Critical Realists. Mr. Strong accuses Mr. Randle, who presses the metaphor, of caricaturing, and where the conception is first introduced by Mr. Drake on p. 27 he writes "the reader is asked to be willing to adopt the hypothesis that the sensa . . . are, *in a sense,* the outward "projection" "of inner existents; i. e. that they are merely imagined or supposed to be out there when inner sensory events occur."[19] Granted then that projection is meant to be a metaphor, is it a significant one? I cannot myself feel that it is. There is certainly some sense in which persons may be said to project their states of mind: Pirandello had much to say about it: and one knows that persons of a certain type eating "a dinner of herbs" under favourable circumstances, will attribute to it some of the properties of a "stalled ox." But such material projection as will account for the size of projections and the reversal of the retinal image is to me unintelligible. Mr. Randle criticises the notion in the number of *Mind* for last July with great force and point. I think however that his criticism is over-severe. He writes as if the Critical Realists supposed the states of mind as such to be projected, whereas it is surely the characters of these states. No other view is consistent with

[18] *Mind, N. S.*, January, 1926, p. 57.
[19] *Mind and Its Place in Nature*, p. 27.

their doctrine of essence. But how are we to conceive of the projection of these characters or logical entities? Does their progress through space take them? Could it be watched? By what mechanism are they abstracted from the existent mental states and shot out? I cannot get away from these absurd questions when I try to make use of the notion of projection. It seems to me to give a quite illusory explanation of the facts under discussion.

If on the other hand we ignore Mr. Drake's metaphor, and consider his other account of cognition—whereby we *refer,* or *impute,* inner states to the external world, we must then acknowledge that this may indeed be a possible hypothesis. But it does not seem that any new facts are explained by it, and the mechanism of consciousness is as mysterious as ever. What is this referring of sentience to the external world? Why do images become larger when referred to a distance? How do the referred or imputed entities turn into *objects* of perception? This kind of referring or imputing can only be regarded as an ultimate and mysterious fact.

The Critical Realists' philosophy then, as expounded by Mr. Drake, is original and interesting, and enshrines, I believe, truths of importance; but it does not help me to understand the mechanism of knowing, nor any particular problems of cognition, and like Mr. Randle I remain convinced that "sensations are psychologically useless." It may occur to the reader that in the most recent version of Critical Realism, epistemology and ontology are closely connected, and that really to establish my point against Mr. Drake I should have to embark on a far-reaching criticism of his book. In this connection I can only venture to suggest that his theory rests on a fundamentally crude conception of space-time; and that the problem of getting objects *in-here* which are *out-there* is wrongly con-

ceived. But such a line of thought cannot be worked out in this paper. I am content if I have indicated that Mr. Randle—though I fear he is in the minority among philosophers—has good reasons for in effect rejecting the constancy hypothesis, and that the Critical Realists have given no very satisfactory reasons for explicitly accepting it. There are other philosophers who have assumed it implicitly. In this connection I shall consider the constancy hypothesis in relation to the sensum theory, as formulated by Dr. Broad.[20]

IV

It is to Dr. Broad that we owe the invaluable name "inspection" for the process of observing sense-data. Dr. Broad draws a very clear distinction between inspecting and perceiving. "Anyone," he says on p. 297, "who has ever put himself in an inspective situation . . . will recognise how utterly different it is to inspect a sensum and to perceive with it." People do not often inspect, he points out, and do not find inspecting easy. The ordinary man is accustomed to inspect his *bodily feelings* when he goes to the doctor, or the dentist. He will find it extraordinarily difficult to see what physical objects become, when they are inspected. I had experience of this in teaching a small brother to draw. He insisted on drawing the *inside* of a vase which—as he sat—was standing above the level of his eye. I expostulated and explained, and urged him to draw what he *saw*. But he assured me that he saw the inside. Until finally losing all patience I exclaimed "Well you sit there till you don't." Would Mr. Bertrand Russell have approved of my tactics, I wonder?

[20] Compare also F. H. Bradley, E. B. Holt, Ogden and Richards, and in more subtle forms Ward and Stout. J. H. Parsons has two curious passages on pp. 38 and 39 of his recently published *Introduction to the Theory of Sense-Perception.*

Now as a philosopher Dr. Broad inspects in order to discover the qualities of the objective constituents of perceptual situations. He says so on page 298. "My main motive as a philosopher for inspecting a certain noise or . . . coloured patch is to describe accurately the apparent qualities of the objective constituent of some auditory or visual perceptual situation." Inspection is used as a method of analysing perceptual situations. As a result of this method perceptual situations are analysed in terms of sensa. Dr. Broad believes that the objects or objective constituents of a perception *a* and an inspection *a'* are alike. They are numerically diverse, but their characteristics are identical. By his own account Dr. Broad believes this on the evidence of a memory judgment.[21] He *remembers* that the object of the perceptual situation had the same qualities as he sees a minute later in the sense-datum which he inspects. The memory judgment is not he admits infallible but "it has as good a chance of being true as any memory judgment, and a better chance than most,"[22] and he implies some scorn for anyone who denies it. But I cannot follow Dr. Broad here, and I put it to the reader does he have a memory judgment of this kind? Notice that it is an odd kind of memory judgment, and one which in ordinary life is rather suspect, for it depends on subsequent experience. Dr. Broad does not remember the object of the perceptual situation until he has observed the object of the inspective situation—otherwise there would be no point in his use of the method of inspecting in order to learn about the former. For my own part I not only fail to remember that the object of a perception *a* is the same as that of an inspection *a'*, but my memory strongly inclines to the belief that it is *not*.

[21] *The Mind and Its Place in Nature*, p. 298.
[22] *Ibid.*, p. 316.

If I lean over a bridge and look at the landscape, I perceive a stretch of water, with a certain bluish surface-colour. A moment later I inspect. The more or less bluish strip of water has gone, and before me is a moving mirror in which are reflected innumerable shadows of trees, houses, and clouds, in a rich variety of colours. I feel much tempted to believe, not only that I did not see these things before, but that I *did* see something which now I do *not* see. If I accept the crude view of every day life, that in perception I look out of my eyes, and see objects face to face, just as they are, then of course I should expect that if the river has not moved away, it is presenting to me its own proper appearance, which remains constant, whether I look hard at it or not. Again, if I accept a causality theory, and the constancy hypothesis, I should expect that, where there is every reason to believe that the visual stimulus has not changed—as in the case of the river—there must be some corresponding psychic element or sense-datum which has not changed *because the stimulus has not*—and that the only question that arises is whether or not this psychic element or sense-datum is *"noted."* But approach the questions without these metaphysical presuppositions, and in the light of the doubts thrown on the constancy hypothesis, is it not clear that the object of inspection is *not* the same as the object of perception, but is what the object of perception can be *transformed into,* under changed subjective conditions?

To anyone who sees the matter in this light Dr. Broad's memory judgment must seem a very strange one. I conjecture that Dr. Broad is finding a reason for what he already believes on other grounds, or because it has not occurred to him seriously to doubt it. Believers in the sensum theory seek an analysis of perception. By inspec-

tion they find sense-data or what they call "sensa." By way of the constancy hypothesis they are led to believe that the objects of a perception *a* and an inspection *a'* are the same. Thus they come by their analysis of perception in terms of sense-data, of which alone we are directly aware.

Let me remind the reader of the analysis of a perceptual situation given on Dr. Broad's sensum theory. When I perceive a tree, I am directly aware of a coloured patch. Bound together in a unique way with this patch are revivals of past experience, possibly images, and feelings of bodily adjustments. Accompanying awareness of the patch, and "in consequence of" the fact that it is bound up with revivals, images, and feelings, is a conviction that the patch is part of a larger spatio-temporal whole.[23] Is this analysis psychologically convincing? I have no hesitation in saying that for me it is not. Firstly, because when I perceive a tree, the object of which I find myself directly aware in a sensible appearance, and not a sense-datum. Secondly because my experience is in accordance with the view suggested by Professor Moore in the symposium on "Sensible Appearance" last year—that there is no "common-sense belief" in the identity of the sense-datum with part of the surface of a physical object. The ordinary man does not easily *see* sense-data, nor has he any views implicit or explicit about them. And when I look about me and perceive trees, the belief that I have is not to the effect that these sense-data are identical with part of the surface of physical objects, but that *these are trees.*

Dr. Broad is not, I think, so unsympathetic to the above view as one might suppose after reading *Scientific Thought.* In *The Mind and Its Place in Nature* he intro-

[23] See *The Mind and Its Place in Nature,* pp. 312 and 151.

duces the notion of an "epistemological object," and I surmise that Dr. Broad is led to introduce this object because he—as psychologist—is conscious that in perception we are directly aware of something other than a sense-datum. This that is other than a sense-datum cannot be a physical object because it is present in hallucinations. Thus we have the introduction of the epistemological object, and Dr. Broad often writes as if there were direct awareness of it. But as Professor Dawes Hicks put it in the symposium already referred to, "Dr. Broad's account of the perceptual situation varies considerably according as he is attempting to describe what as psychologists we actually find it to be, and what in order to meet the exigencies of his theory it must be." According to the sensum theory as first formulated by Dr. Broad, we are directly aware only of sense-data, and perception is distinguished from sensation or inspection by the presence of a belief or a claim. There is really no place in this analysis for anything that could properly be called an epistemological *object,* and the inconsistent statements about the epistemological object which were pointed out in the symposium, seem to me to be due to Dr. Broad's recognition that the sensum theory—inspired by the constancy hypothesis—is not verified by observation.

V

If then we reject the constancy hypothesis and the theories of perception of which it forms—explicitly or implicitly—a part, how are we to conceive the situation? We must recognise of course at the outset the truth of the Cermak-Müller axiom—similarity or difference in the *phenomenal* events corresponds to similarity or difference

in the relevant *psycho-physical* processes.[24] If I perceive a world very different from the one I perceived a moment ago, then the corresponding psycho-physical processes are in some way very different too. But the question is in *what* way?

The only answer to this question is that we have very little idea. I am advocating at the least a negative position, in virtue of which we may approach the problem with an open mind, unhampered by innate conceptions. There is no point to point correlation between objective stimulus-element and subjective-element, and consequently there is no reason to believe in the existence of a mass of "unnoted" sensations corresponding to stimuli. Moreover if we are to make use of the notion of "psychic atoms"—as is advocated by Prof. Strong—we cannot conceive of them as *microscopic bits of psychic stuff*—after the manner of the billiard-ball physicist. This second point is clearly of fundamental importance for the philosophy of sense perception. Atomistic parallelism springs from the physiology of Borelli and the psychology of Hume. But it is a notion which, as I have tried to show, it is extremely hard to put by; and this both because it is deeply ingrained in the thought of the last three centuries, and because it is in fact a simply-grasped and easily applied 'Hilfsmittel.' Parallelism shelves the great problem of the relation of percipient and perceived. Atomicity is a familiar scientific concept and bound up with the seventeenth century view of *substance*. Belief in psychic substance or sensations justifies the use by thinkers of the analytic method which can be practised by any one of them in his study, and which is logically analogous to

[24] This axiom must not be confused with psycho-neural parallelism. The latter asserts a relation between *psychical* events and *cerebral* events, and is a quite different doctrine, conceived atomistically.

the method employed in the physical sciences. It is so obviously easier and more scientific to deal with one's subject matter piece-meal. If the subject matter is something as elusive as a state of mind, or the perceptual field at a given time, let us by all means use a method which is easy and scientific. But while the rejection of parallelism involves the reassertion of our ignorance concerning the relation of the organism to the world which it perceives, the rejection of atomicity points, I believe, to a conscious and careful rejection of the *substantival* view of mind, according to which it consists of psychic stuff (somehow attached to the brain) which—mercurial though it is—can sometimes be held still and analysed.

Two immediate concrete problems present themselves. Belief in sensations not only eased the situation as a whole, but it enabled theorists on sense perception to give some account, however inadequate, of perceptual "illusions," of otherwise unmotived actions, of failure to recognize or find objects, of feelings of familiarity, of awareness of change in the perceptual field (e. g. the stopping of the clock) and of a host of other every day phenomena. Under the influence of the realists "unnoted" sensations turned into "unnoted" sense-data and, supplemented by the traditional conception of "attention," they did good service. Thus any theory of sense perception which denies sensations has to explain these phenomena in terms of other concepts.

So much for what is involved in the denial of sensations. There remain the observable entities, sensible appearances, and sense-data. One cannot be analysed in terms of the other, as is, in effect, done in the sensum theory. The tendency so to do is based, I have tried to suggest, on the too uncritical acceptance of the "constancy" principle—that a sense-datum is guaranteed by its stimulus,

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and is to be regarded as being *there*—in the visual field—in spite of appearances to the contrary. But doubts have been thrown on the "constancy" principle. We are told that the visual field forms a unity of system, as well as a continuum, and that sense-data can no longer be regarded as "inert and visibly inactive." In these circumstances is it not necessary to take the visual field at its face value? and to disallow (a) hypothetical entities,[25] and (b) the hypothetical existence at a given time of an entity to which there is no reaction?[26] A descriptive study of the relations of sense-data to sensible appearances, of the laws which govern them, and of the conditions under which one may be changed into the other, appears to me to be a very necessary prolegomena to any theory of sense perception.

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[25] See the Critical Realists.
[26] See the sensum theory.

THE PSYCHOPHYSICAL PROBLEM—A NEGLECTED SOLUTION

REALISM has always had a great deal of trouble with the psychophysical problem. If matter and thought are both real, how can there be any relation of the one to the other? To avoid this difficulty there have been developed various monistic theories, which have been compelled to make one or both of the pair, matter and thought, unreal, although in experience they appear equally real, Idealism, until recently the dominant tendency in philosophy, completely denies the reality of matter. But modern science has been telling us so much about the inner structure of material objects, their electronic constitution and the forces existing between those electrons, that it has become difficult to think that these material particles are mere figments of the imagination, with the result that realism is again coming into vogue. But then the psychophysical problem again comes to the fore—how can matter become thought? If thought and things are disparate, how is knowledge possible?

We have here to present a solution of this problem which avoids the objections that have been made to the traditional psychophysical theories, and which solves the problem in a remarkable way. It is extremely ancient, but, owing to historical circumstances, it has been neglected by the European philosophical world. Its antiquity compels us to present it in a new dress of our own, adapting it to

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the discoveries of modern science. We shall first present it dogmatically as a speculation, and then show how very powerfully it accounts for the facts of the situation.

On the one hand, we know that physical objects exercise their effects upon the sense organs of the body, through light waves, air waves, pressure, etc., precisely as physics and physiology describe them. These sense organs excite disturbances in certain neurons, which disturbances are finally carried to the cortex of the cerebrum, whence further neuronic disturbances descend to other bodily organs. These neuronic disturbances are not conscious experience; they are material events, which are, however, intimately connected with conscious thought.

Thus far we have proceeded with modern science. Our hypothesis carries us further. In addition to these material disturbances, there exists a pure consciousness, which is just as much beyond experience as are the material objects that science postulates. The relation of this pure consciousness to the brain is like that of a source of light to its objects. Consciousness is a self-illuminating source of illumination, which illumines the whole psychic life; much as if we were located at a point source of illumination, and could perceive the objects illuminated by that light, but not the source of illumination itself. In some such fashion, this pure consciousness illumines its objects and renders them conscious. Our hypothesis is thus an analogy, but the most successful of scientific theories are likewise analogies so we are justified in presenting it in this fashion.

A hypothesis can only be tested by its consequences; we must next ask how far this theory can explain the facts of the knowledge process as we know them.

The most important consequence is that, by this theory, thoughts and conscious experience are not consciousness,

but merely objects of consciousness—illumined and made conscious by consciousness, nevertheless distinct from consciousness itself. Yet they appear to be conscious, since they are illumined by consciousness, and so are naturally confused with consciousness. This confusion of the objects of consciousness with consciousness itself is the misconception which has prevented the appreciation of the true nature of the knowledge relation. In examining thought, we do not perceive consciousness, but only its objects. Consciousness and its objects are as distinct as a light and the objects illumined; we can know as little (and as much) about consciousness by examining its objects as we can know about a light by examining the objects it illumines.

It is thus possible to say truly that thoughts themselves are not psychical, but material—they are nerve currents. Nevertheless they appear as psychical, since they only appear when illumined by consciousness. These mental images could not have appeared as conscious if there were no consciousness to illumine them. Yet thoughts themselves are material. Thus knowledge is made possible—for the effects of objects upon sense organs, and these upon neurons, and these upon thoughts are all material—nowhere is the chain of causation from stimulus to response upset or broken; physical causation remains continuous; the conservation of energy is maintained: at one point that causal chain is illumined by pure consicousness, and knowledge occurs. In this way, natural causation is maintained unimpaired, but a place is made for a consciousness which is disparate from physical events.

We must then distinguish between consciousness and knowledge or mind (taken as the sum total of experience). The two are distinct and yet related. All mental phenomena are material; perception, memory, learning, reasoning

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are all material, and so are subject to the errors and deficiencies of material events, yet they become conscious. Unconscious cerebration becomes a fact, for all cerebration and thought are material; the center and fringe of conscious experience likewise become a fact, for not all brain happenings are equally illumined, but only those of a limited portion, and there is usually a focus of illumination, with other parts of the field less strongly illumined.

The diversity of the brain now becomes compatible with the unity of conscious experience. Neurons are many and complexly interconnected; there is no center to the brain or nervous system in the pineal gland or any other single spot; the cortex of the cerebrum is a spread out surface, intricately interconnected. Yet conscious experience is one, for consciousness is one, and so its illuminations are one. Furthermore the unknowability of consciousness in itself is accounted for; since consciousness is the pure subject, that pure subject without any object is beyond experience. Only the objects of the subject can be experienced; the subject cannot become known without becoming an object, and so becoming other than itself. Thus consciousness remains forever pure subject. As to the nature of consciousness in itself, such metaphysical speculations are beyond the scope of this paper. But it can be seen that our theory is equally compatible with a plurality of individual souls or a unitary Absolute Ego, This Absolute Ego might be eternal or these souls unitary, immortal and indestructible, and yet such a metaphysics would be quite compatible with a similarly eternal, indestructible, and diverse matter.

By examining the nature of the theory which we have propounded, it is seen to be quite different in kind from any previous European solution of the psychophysical problem. It shows itself to be a dualism which is neither interaction-

ism nor parallelism. It does not assume any pre-established harmony such as that of Leibniz, nor are mind and body two aspects of one substance as with Spinoza. Consciousness is not reduced to body (epiphenomenalism) nor is body reduced to consciousness (physical monism). Consciousness and body are distinct and different. Yet consciousness has a real place in the knowledge process; it is not a superfluity but a necessity, for without it there would be no such thing as conscious experience. Matter likewise has a real place in mental life; it is equally necessary with consciousness; without matter there could be no conscious experience. Yet there is no interaction of the one upon the other. Both are real and independent. Our solution of the psychophysical problem is thus neither a materialism nor a spiritualism, but a dualism, as is required by the obvious facts of experience; yet it is a dualism which makes knowledge and conscious experience possible. Such an extraordinarily suggestive and powerful theory is worthy of serious consideration on the part of all philosophers.[1]

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[1] The theory herein outlined is not that of the author, but a restatement of the ancient Samkhya theory of knowledge in terms of modern science.

RELATIVITY AND ITS PRECURSORS

THE theory of relativity takes its root in a view which, though a commonplace to all thoughtful modern scientists, accepted alike by Relativists and anti-Relativists, appears to the man in the street as a startling paradox. Even to the philosopher, if he belongs to a certain school of thought, it has the appearance of a metaphysical heresy and one which he is liable to label by the title of relativism, a practice tending to confuse the issue when the relativity of modern physics is under discussion.

The view in question has to do with motion, something which in the opinion of the unscientific man is a self-given reality, like redness or sweetness, so that he can see no necessity whatever for inquiry into its nature. And there might indeed be no need of this if mankind had no more to do with motion than to gaze lazily at the movements taking place under our eyes. But such is not the case; science must measure motion with precision and be able to describe its course and its speed. That this may be done it is requisite for motion to be referred to something taken as standard of immobility, or, more precisely put, referred to a system of coordinates based on three non-collinear points taken as fixed and immovable. And the doctrine mentioned above, and which, as has been said, is *not* that which distinguishes relativity from other theories of physics, is that unless this prerequisite has been fulfilled it is

nonsense to speak of motion in a scientific discussion; that motion is necessarily always motion relative to something.

In a somewhat broader sense, in which it is applicable to everyday life as well as to the domain of science, the doctrine is that motion cannot be intelligibly spoken of save as a change of observable phenomena, and indeed one consisting of change in distance, in direction, or in both, of something as regards something else. The view that motion has as its essence a change of observable phenomena was plainly set forth by Leibniz who, replying to the contention that "the fact of movement is independent of observation," remarked: "Movement is indeed independent of observation but it is not independent of observability. There is no movement when there is no observable change. And in fact when there is no observable change there is no change at all." Leibniz contended that space was something purely relative, merely "the order of bodies among themselves," and regarded as absurd the doctrine of absolute space and the "fiction of a material finite universe promenading as a whole through an infinite empty space." Leibniz, in short, took substantially the ground delineated by Sir John Herschell in the words: "Space in its ultimate analysis is nothing but an assemblage of distances and directions." Under this, the only rational view, the *situation* of a body in space is constituted by its distances and directions from other bodies, and it would be well to distinguish the *position* of a body from its situation. Just as a man is said to be in different situations when he is facing and when he has his back turned to the observer (such a difference in posture having been regarded by Aristotle as of sufficient importance for consideration under a separate category) so a rotating sphere may be considered as constantly changing its position while remaining all the while in its original situation. The situation of a

point of body, usually called a "point of space," may for greater clearness be termed a *site*. A true point is the intersection of lines on a material body, while a true line is the intersection or boundary of surfaces and must be distinguished from the *path* through space of a moving point, often improperly called a "line," a distinction the importance of which will be manifest later.

The influence exercised by Leibniz on the philosophy of physical science was far less than that of his great contemporary and rival Newton, and the authority of the latter lent support to quite a different doctrine. Newton refrained, he said, from defining time, space, place and motion because they were well known to everyone. He added, however, "Only I must observe that the vulgar conceive these quantities under no other notions but from the relation they bear to sensible objects." Newton held that, on the contrary, "In philosophical disquisitions we ought to abstract from our senses, and consider things themselves, distinct from what are only sensible measures of them." He distinguished between relative and absolute place and motion, stating that "Absolute motion is the translation of a body from one absolute place into another; and relative motion the translation from one relative place into another." "Place is a part of space which a body takes up." "But because the parts of space cannot be seen or distinguished from one another by our senses, therefore in their stead we use sensible measures of them. For from the situations and distances of things from any body considered as immovable, we define all places; and then with respect to such places, we estimate all motions, considering bodies as transferred from some of these places into others. And so instead of absolute places and motions we use relative ones."

Measurability was, in point of fact, the chief char-

acteristic of the new physical science that was being built up in the days of Newton. The new physics substituted precise quantitative conceptions of motion, mass, force, etc., for the vague qualitative conceptions of the Aristotelian and Scholastic theories. Relative motion, since it alone could be measured, was the only kind of motion really relevant in physical inquiries. A relative place can be determined by measuring its distance and direction from a given body; a relative motion likewise can be perceived and measured. But the alleged absolute place and absolute motion, those vestiges of the old physics which Newton strove to retain in the new, elude not only all measurement but even all perception. There is no way of specifying the absolute place of anything and none of measuring absolute motion; these cannot even be perceived. Indeed Newton himself remarked that "it may be that there is no body really at rest to which the places and motions of others may be referred." "No other places," said he, "are immovable but those that from infinity to infinity do retain the same given situations one to another; and upon this account must ever remain unmoved; and do hereby constitute what I call immovable space."

Newton does not appear to have considered the question of what absolute motion could be in itself. He took the naive stand that there was no necessity of inquiring into the nature of the absolute motion whose existence he affirmed, and apparently failed to see that in every case of motion there must be implied some sensible standard of reference, tacitly if not explicitly. Had he been able to cast off completely the trammels of the ancient teachings he would have realized that even when the adjective "absolute" is affixed, it is impossible to say intelligibly that a body is at rest or in motion *per se*. Such a statement has no meaning unless another phrase is added to the effect

that the motion or rest is in reference to something else specified therein. Newton apprehended that the observable phenomena of recession or tendency of recession from a certain axis in a body (*e. g.* the earth) ought to be interpreted as evidence of that body being in absolute motion of rotation around that axis, and so formulated the laws of mechanics as to necessitate this interpretation being made. Had he boldly taken these centrifugal phenomena not as *evidences* of motion in reference to nothing in particular but as basis for the very *definition* of "absolute motion of rotation" his standpoint would have been unassailable. Plainly however he would thereby have been giving a new and decidedly non-natural meaning to the word "motion," and this he was not prepared to do.

Following the lead of Newton, physicists for several centuries continued to speak vaguely of an "absolute motion" which was unmeasurable, while dealing solely with relative motion amenable to their measurements. Clarification of the topic did not come until the last half of the nineteenth century, and was due to two very remarkable men: Carl Neumann and Ernst Mach. These scientists, on considering the classical laws of dynamics which speak of uniform motion in a straight path, put the question whether or not these laws could be affirmed without reservation as to the reference system in view, and found the answer to be in the negative. And this is indeed quite obvious, for a path that is straight under some systems of coordinates will not be straight under others. Thus a body moving in a rectilinear path under a system of coordinates based on the sun as standard of immobility will not usually move rectilinearly when the earth is taken as standard of immobility. As an illustration of this suppose there to be a balloon suspended above the earth and rotating around a vertical axis. And suppose a body to move upward

vertically from the earth to the balloon collinearly to this axis, striking the center of the bottom of the balloon while another body also moving up vertically strikes the periphery of the bottom. Moreover suppose a third body to move horizontally towards the balloon in what is a straight path from the standpoint of earth as reference body, and let the three paths from this standpoint be of equal length.[1] We have then rectilinear motion of three bodies over equal distances. All this is from the standpoint of a system of coordinates based on the earth, that is, based on taking the earth as standard of immobility. But suppose now that a new system of coordinates be adopted, based on the balloon as standard of immobility, this being regarded as stationary while the earth is supposed to rotate not around its ordinary polar axis but around the vertical axis passing through the center of the bottom of the balloon. Under this system of coordinates the first body will as before have moved in a straight path, but the second will have moved in a helix and the third in a spiral and these three paths will not be equal in length. And if the balloon, besides rotating as regards the earth, is moving upward vertically with a speed equal to that of the second body, then when change is made to the balloon as reference basis the path of the second body will be a closed circle. To visualize these facts we may suppose the second and third bodies to carry bits of lead pencils which trace the paths they have taken as marks on sheets of paper. The earth reference system will be represented by a vertical paper cylinder and by a horizontal sheet of paper, both attached to the earth. The balloon reference system will likewise be represented by a paper cylinder and a flat sheet of paper, but these will be attached to the balloon. Even a

[1] Strictly speaking we should consider not the path of each body as a whole, but the path of some particular point on each body.

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person unversed in the technique of analytical geometry can see in this way the difference between the paths under the two systems of reference and perceive that what will be straight under one coordinate system may be helicoidal or circular, or spiral under another. And thus the impropriety of calling the path of a moving point a "line" is apparent. For a line is something absolute and immutable, entirely independent of the reference system in view, while a path is relative, its character depending on what is taken as standard of immobility.[2]

It is hence obvious that Galileo's law which asserts that a material point set in motion and then completely left to itself, no external influences acting upon it, will move in a straight path and pass over, in equal times, equal distances measured along the path, is incomplete and indefinite. For it does not say what reference system is in view. The law assuredly cannot hold under all reference systems, for if a given material point is, in conformity with the law, moving uniformly in a straight path from the point of view of one reference system, we can always find another reference system under which it is not moving in a straight path, so that under this latter system the law is being violated. Here many scientists were inclined to imagine they could cut the Gordian knot and brush the whole problem aside with the remark that of course the laws of dynamics are to be construed as referring to the *true* standard of immobility. But the question at once arises; What *is* the true standard and why is it to be accepted as true? In what sense, for instance, can it be asserted that taking the sun or the "fixed" stars as standard of immobility is

[2] Further discussion of this very important distinction between paths and lines and also a more thorough investigation of relativity, special and general, will be found in the forthcoming second part of a work by the present writer in collaboration with Professor Landis: *Fundamental Conceptions of Modern Mathematics*, the first part of which, *Variables and Quantities*, was published by The Open Court Publishing Co. some years ago.

any "truer" than taking the earth as standard? In what sense is it legitimate to say that it is "true" that the earth revolves around the sun and rotates on its axis and "false" that the earth is stationary and the sun and fixed stars revolve around it in immense orbits once every twenty-four hours? Motion of bodies is essentially change of distances or directions between them. And if we have in view two bodies with which such change takes place we can equally well say that the first is moving and the second stationary, that the first is stationary and the second moving, or that both are moving. The observed facts, the changes in distance and direction, remain the same; we are merely using three different ways of describing the same set of facts.

The problem then is far more subtle than the casual thinker might imagine, and it was solved in one way by Neumann and in quite another by Mach. Neumann held fast to the classical theory of mechanics and contended we must, to justify this, postulate the existence in some unknown part of space of a body unknown to us (called by him Alpha) which is absolutely rigid, its shape and dimensions being unchanged through all eternity. He conceded indeed the possibility of basing an "Alpha" reference system not on a perfectly rigid body but upon the "three so-called axes of inertia of a material body" whose shape and dimensions were subject to change, and even the possibility of the system Alpha being constituted by the chief axes of inertia of the universe, but neither the sun nor any known "fixed" star can be taken as standard of immobility; none of these can be regarded as stationary if the classical laws of mechanics are to hold good. A body then is to be deemed "truly" at rest or "truly" in motion according to whether it is at rest or in motion as regards Alpha. The Alpha system of coordinates is the

standard of "absolute" motion, and the laws of mechanics must be construed with this reference system in view. Neumann considered also the standard of time. Since time is measured by motion, the classical statement that a moving material point, influenced only by its own inertia, will pass over equal distances in equal times presupposes a given motion taken as standard—as the type of uniformity. And to obviate this difficulty Neumann proposed to modify the statement in question by making it assert that *two* moving material points, each of which is left to itself, will move in such a manner that every distance travelled by the one always corresponds to (*i. e.* is isochronous with) an equal distance travelled by the other.

Neumann's procedure is evidently tantamount to taking the classical laws of mechanics as constituting an implicit definition of absolute motion. We must, he holds, take as the "true" system of reference one which makes these laws hold good. Mach however looked at the matter from a different angle, and took the standpoint of relativity, rejecting absolute motion altogether. "Obviously," said he, "it does not matter whether we think of the earth as turning round on its axis or as at rest while the celestial bodies revolve around it. Geometrically these are exactly the same case of a relative rotation of the earth and of the celestial bodies with respect to one another. Only the first representation is astronomically more convenient and simpler. But if we think of the earth at rest and the other celestial bodies revolving round it, there is no flattening of the earth, no Foucault's experiment, and so on—at least according to our usual conception of the law of inertia." The difficulties which Mach found in the law of inertia, he remarks, "exactly coincide with those of Neumann" but the latter's solution was not the only one possible, there being really two alternatives: "Either all motion is abso-

lute or our law of inertia is wrongly expressed. Neumann preferred the first supposition, I the second." The law of inertia, Mach contended, ought to be so conceived that exactly the same thing results from the supposition of the earth as stationary as from the usual supposition that it is moving.

The thesis thus set forth by Mach is the *standpoint of relativity,* of which what is now known as the theory of relativity is merely the development in a perverted way. Thus the most important feature of the general relativity theory, its so-called law of gravitation, which is not really a law of gravitation at all but a law of motion,[3] is a realization (though an imperfect one) of the expectations of Mach that "integral laws, to use an expression of C. Neumann, will some day take the place of the laws of mathematical elements, or differential laws, that now make up the science of mechanics, and that we shall have direct knowledge of the dependence on one another of the situations of bodies. In such an event, the concept of force will have become superfluous."

The constant coupling of the word "relativity" with the name of Dr. Albert Einstein has made prevalent the erroneous impression that relativity originated with that physicist, and if the casual reader were asked to whom the theory of relativity was due he would be likely to accredit the alpha and omega of it to Einstein. This however is a gross error. The standpoint of relativity, as we have seen, originated with Ernst Mach, and even the speculations of that particular school of thought of which Einstein is the most prominent figure cannot be accredited

[3] The fundamental equation of Einstein's theory of gravitation does, it is true, involve ten coefficients sometimes said to represent the *potentials of gravitation,* and the subsidiary equations by which these coefficients are determined are called the *field equations of gravitation,* but in these phrases the word "gravitation" does not have its classical sense.

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to him alone. Thus, with what is known as the special theory, if we consider as paramount factor not the detail work but the guiding thoughts by which this was inspired, then the father of this special relativity theory was undoubtedly Henri Poincaré.

Einstein, in working out the details of his special theory, followed precisely the path previously mapped out by Poincaré as suitable for developing a theory on the basis of relativity. It was Poincaré who pointed out the importance in such a scheme of the mathematical formulas of the Dutch physicist, H. A. Lorentz (who had indeed been anticipated by W. Voigt in 1887) and introduced the name "Lorentz transformation," so familiar to the readers of Einstein's works. These formulas were at Einstein's disposal, though it is claimed he had not read Lorentz's work, published in 1904, before writing his own fundamental article. This fundamental article by Einstein, *Zur Elektrodynamik bewegter Koerper,* did not appear until 1905, but as early as 1898 Poincaré (in *La Mesure du Temps*) had given utterance to the primary thought of the special theory of relativity: that we cannot intelligibly speak of the simultaneity of two events occurring at places far apart without some convention, constituting a criterion of simultaneity, and equivalent to signalling between the two places, a signalling which would most naturally be conceived to be carried on by means of light rays. This, Poincaré noted, led to the doctrine that "The simultaneity of two events, or the order of their succession, the equality of two durations, are to be so defined that the enunciation of the laws of nature may be as simple as possible." He also pointed out the possibility of basing a "new rule for the investigation of simultaneity" upon the postulate that "light has a constant speed, and in particular that its speed

is the same in all directions." This postulate which, somewhat enlarged, is one of the fundamental assumptions of special relativity, Poincaré asserted (though erroneously) was one without which no measurement of the speed of light could be made. It "could never be verified directly by measurement; it might however be contradicted by this if the results of different measurements were not concordant."

Poincaré (in *La Theorie de Lorentz et le Principe de la Reaction*) envisaged correlating physical phenomena no longer to true time but to Lorentz's local times, and put forward the doctrine that the laws of nature ought in their mathematical formulation be covariant as regards Lorentz transformations. He foresaw the rise of a new mechanics in which "the inertia increasing with the speed, the speed of light would be a limit beyond which it would be impossible to go" (*The Present and Future of Mathematical Physics,* a paper read before the Congress of Arts and Sciences at St. Louis in 1904.) It was Poincaré who first made use of the name "postulate of relativity," which, however, he defined as the law of the impossibility of finding experimental evidence for the absolute motion of the earth. The theories of Minkowski, Einstein's most important coworker, likewise constituted a following out of Poincaré's ideas. In 1905, three years before Minkowski took the field, Poincaré, in *L'espace et la Temps,* remarked that it might be advisable to abandon the old view that time and space were "two entities entirely distinct which can be imagined separately" and to regard them as "two parts of the same whole and two parts which are so closely interwoven that we could not easily separate them." And he voiced the thought that in the representation of motion the time concerned might appear as a

fourth and imaginary coordinate of space. Even the relativist dogma that gravitation cannot be propagated instantaneously was foreseen by Poincaré who pointed out that "in this new mechanics there is no effect which is transmitted instantaneously."

In the general theory of relativity the basic thought is that of Mach, *viz.* the replacement in dynamics of the law of gravitation by a law of motion. But in what Einstein built upon this basis the influence of Poincaré is again manifest. Einstein, in considering the motion of bodies in gravitational fields, where they do not move uniformly over rectilinear paths, brought into play the conception of a local puckering of "space-time," a deviation from its normal character, to an extent depending on the strength of the gravitational field, as an interpretation of this deviation from the normal motion of a body, that is, its motion where no gravitational influence is apparent. And this is an obvious outgrowth from Poincaré's doctrine that if there were observed anomalous phenomena in the transmission of light from distant stars which could be described as deviation of light rays from their normal rectilinear course, this could also be interpreted as a non-Euclidean structure of (a non-zero curvature of) space. And in view of all these facts one does not know at which to be the most astounded: the magnanimity of Poincaré who was always over-anxious that there should be recognition of the labors of those who had reaped where he himself had sown, the apathy of his friends after his death, or the peculiar attitude of Einstein and his coterie, exemplified by Born of Goettingen, who refers to Poincaré as one of those who "collaborated" with Einstein in the development of the relativity theory!

For years Mach battled for the standpoint of relativity

almost singlehanded and under great discouragement. When he brought to the attention of physicists the "indefiniteness, the difficulties and the paradoxes" found alike by Neumann and himself in the law of inertia in its classical form he encountered, he says, "disdain and surprise" from almost all the physicists with whom he discussed the subject. This is in striking contrast with the enthusiastic reception given the "relativity theory" of to-day. The contentions of Mach and Neumann, having on their side merely irrefutable logic, were disdained. Relativity theory, so-called, notwithstanding the fantastic and illogical features it embodies, has been acclaimed because of the allegation that certain predictions made by it, certain consequences flowing from it, have been verified by astronomical observations. Unfortunately in the eyes of many "scientific" men, such a verification of the consequences of a theory is sufficient to prove the truth of the premisses from which these consequences follow, no matter how preposterous these premisses may be in themselves. This pseudo-scientific mentality is undoubtedly due to the divorce of science-teaching from logic. It is no exaggeration to say that ninety per cent of college graduates in science are unaware that true conclusions can follow from false premisses by perfectly sound processes of reasoning, and that at least fifty per cent of the professional teachers of science are not alive to this elementary logical truth and to its bearing on scientific hypotheses.

Mach's attitude towards "the Relativists" was an unfavorable one. In his *Principles of Physical Optics* he said: "I must . . . . . as assuredly disclaim to be a forerunner of the relativists as I withhold from the atomistic belief of the present day." And he promised to set forth in a later work "the reason why and the extent to which,

I discredit the present-day relativity theory, which I find to be growing more and more dogmatic, together with the particular reasons which have led me to such a view—the considerations based on the physiology of the senses, the theoretical ideas, and above all the conceptions resulting from my experiments." This repugnance to stand as godfather to the divagations of the Relativists is natural, but it must not blind us to the fact that the "relativity theory" is unquestionably an offshoot of the doctrines taught by Mach. The quintessence of Mach's standpoint of relativity is embodied in his protest against the classical formulation of the law of inertia because it failed to take into account systems of coordinates based on reference bodies rotating (or in other difform motion) as regards the Alpha system, but could be asserted only when the system of reference in view was Galileian, that is was based on Alpha or on some other system of coordinates which, as regards Alpha, was either at rest or in uniform motion of translation. And we can only regard as a development of this the more sweeping demand put forward as the General Principle of Relativity, the postulate that "The laws of physics must be so constituted that they remain valid for any system of coordinates moving in any manner."

The theory of relativity, as set forth by Einstein and his school, is subdivided into two parts. The first, the theory of special relativity, deals solely with Galileian reference systems, and in it there is enunciated the Special Postulate of Relativity which runs: "If a system of coordinates, K, is chosen so that in relation to it physical laws hold good in their simplest form, *the same* laws also hold good in relation to any other system of coordinates, K,[1] moving in uniform translation relatively to K." Thus in the special theory of relativity there are privileged

reference systems which are alone considered. And in the use made of this postulate it is assumed, rather gratuitously, that when K is chosen in accordance with these specifications it (and hence all the other privileged reference systems) will be Galileian. That is, precisely the same reference systems are given special privileges in the Special Theory of Einstein as in the Galileian-Newtonian Theory. By the side of his special relativity postulate Einstein puts forth a postulate concerning the speed of light to the effect that, when in a vacuum and uninfluenced by gravitation, every ray of light moves, as regards what he calls "the stationary coordinate system" (*i. e.* whichever Galileian coordinate system happens to be first taken into account) in a rectilinear path with the constant speed of c (that is about 186000 miles per second) regardless of whether the light is emitted from a body at rest or from one in motion. And here, of course, he is deviating from the classical theory of light propagation, for by this the speed of light was not understood to be 186000 miles per second under whichever Galileian coordinate system we might choose to start with; the speed in the classical theory would be accepted as 186000 miles per second only as regards a reference system which makes the hypothetical light-transmitting medium stationary. Nor is there in the classical theory of optics anything which identifies this particular reference system with the suppositious system as regards which the heavenly bodies have the "absolute motion" imagined by Newton. It is a misrepresentation of fact to say, as Einsteinians sometimes do, that in pre-Relativist days the luminiferous ether was taken in classical physics as the basis for an absolute system of coordinates; the thought did not even arise of calling in optics to aid the theory of mechanics.

The Relativists give their special postulate an interpretation, where light is concerned, which makes this innocent looking proposition one pregnant with paradoxes. For they apprehend that if "the same laws" are to hold good with all the different Galileian reference systems then the speed of light must always be *c* miles per second, no matter *which* Galileian reference system be under consideration. That is, if a ray of light is moving out from a Galileian reference body (*i. e.* a body which when taken as standard of immobility gives a Galileian system of coordinates) with a speed of 186000 miles per second towards a body which moves rectilinearly to meet it with a uniform speed of 93000 miles per second, then, according to the Relativist view, when this second body is taken as a new standard of immobility (giving rise to another Galileian system of coordinates) the speed of the ray of light measured with reference to the new system cannot be 279000 miles per second as pre-Einsteinian thinkers would have opined, but must still be merely 186000 miles per second. Likewise, no matter how fast a body may be retreating from the source of light, the speed with which a ray of light overtakes it must, whether measured with reference to the source or with reference to the receding body, be always 186000 miles per second. Again, if two bodies, each so moving that it is capable of being taken as a Galileian reference body, clash at a point as they pass one another, emitting then a single wave of light, this wave, according to both the classical and the Einsteinian theory, would spread out in the form of a luminous spherical shell. In the classical theory the center of this shell would be either the point of the first body which clashed with a point on the other, or the point of clash on the second body, or neither, according as either the first body or the second

body or neither was stationary as regards the ether. But according to Relativist doctrine, if the first body be taken as standard of immobility the point on it is and remains the center of the spherical shell, while if the second body be taken as standard the point on this body is and remains the center, and this will continue to be the case even after the two bodies have moved a few million miles apart. Since it is by a mere fiat of the human mind that either body is made standard of immobility, this doctrine will seem to the layman very much like the assertion that a sphere has two centers. It can, in fact, only be maintained by special Einsteinian methods of measuring distances. And such manipulation of measurement, which is applied not only to distances of space but also to lengths on bodies and to durations of time is an essential feature of relativity theory. That it is possible to lay down conventions of measurement under which distances, lengths and durations are measured in various eccentric ways must be conceded. For instance there is no logical inconsistency in some one laying down the fiat that the measurement of all lengths and distances is to be based on a rubber yard-stick which he holds in his hand and takes as standard of length. He can then assert that as he stretches his yard-stick Paris and London come closer and closer together, and that he can make the number of miles between them be only half what it was before. This statement, properly understood, is undeniable, but it is not a fact of any moment, and the system of measurement under which it is true is in no way useful to mankind. The rubber yard-stick of the Relativist is their doctrine that light always has the speed of 186000 miles per second as regards every Galileian reference system whatsoever. This they set up as a veritable fetish, demanding that science so adjust all its measure-

ments as to make this dogma hold good. Here at once it becomes evident how far a rational *standpoint of relativity* is from affording support to the special postulate of relativity. According to the former we ought indeed be able to describe the phenomena of nature from the point of view of any reference system we choose to adopt, and taking any particular reference system it ought to be theoretically possible to formulate the laws of physics with this as basis. But it would be taking an unjustifiable step in the dark to pass from this to the Einsteinian doctrine that the general laws of physics can and ought to be so formulated as to be "the same" when different reference systems are in question, and to regard this sameness as requiring light to have the speed of 186000 miles per second no matter what Galileian system of coordinates be in view. And still more serious is the step taken in the general theory of relativity where sameness of general laws is (again on *a priori* grounds) required alike for Galileian and non-Galileian reference systems, the "sameness" stipulated here being technically described as "covariance of the general equations of physics towards all transformations of coordinates." Relativists argue that a particular coordinate system is merely a particular way of observing nature, and that as it is unthinkable that an observer can change the course of nature by merely changing the point of view from which he looks at it, the general laws of nature must be "the same" under all systems of coordinates. Yet, strange to say, they hold that the length of a body (and the duration of an event) can be and is changed by merely looking at it in a different way—by a mere change in the coordinate system under which it is viewed—this contention, which would overthrow completely the mensuration of classical science, being necessary to uphold

the Relativist view under the interpretation Relativists give to the phrase "sameness of law."

, The scientific methods of measurement which the Relativists ask us to abandon rest essentially on the assumption that devices for measuring lengths, durations, etc., are not effected by mere displacement in time or space or by mere change of the reference system in view. The affirmation that the length of a measuring rod, and in general the size and shape of a body, is not changed by transporting it to a different situation is termed the Axiom of Free Mobility, and is one of the basic principles of geometry as that science has hitherto been understood. One kind of change would indeed be of indifference and that is a change of all bodies, measuring rods included, in the same proportion. For then the results of measurement would be invariable, and such a change would be unperceivable by the senses and could not be noted. In fact it cannot be envisaged even as a possibility if we take the sound philosophical ground that perceivability is the *sine qua non* of fact. The Axiom of Free Mobility then merely asserts consistency of measurements, of comparisons made at different places, and is sometimes more properly set forth as the Axiom of Congruence, asserting that if two geometrical figures are congruent (can be made to fit exactly on one another) at one place and time they will also be congruent at every other place and every other time. Likewise in measuring durations there is assumed an Axiom of Consistency in Synchroneity to the effect that regular natural processes which are synchronous at one part of space and at one time will be synchronous at every other; that, for instance, a chemical process which measured by a clock takes t seconds at one place and time will at another place or another time or at another place

and another time again require precisely t seconds for its completion on timing it by the same clock. Science does not, it is true, assume that there are any wholly rigid and invariable bodies making perfect measuring rods or any perfectly running clocks. But it does assume that variations in the standard of measurement can be compensated and allowed for, and that these variations are never due to mere space or time or to the reference system adopted but are caused by other observable phenomena such as impressed force, temperature, etc.

A much deeper and more coherent thinker than Einstein (and one of his critics) Paul Painlevé, has pointed out that all science has hitherto been based upon what he terms the Principle of Causality, namely, "When the same conditions are realized, at two different instants, in two different places of space, the same phenomena always reproduce themselves displaced solely in space and time."[4] This principle presupposes the existence of methods for measuring lengths, durations, etc., and is only true when suitable conventions of measurement have been adopted. And thus the principle has as an implication that "It is possible to adopt once for all and for all phenomena a measure of length and a measure of time such that the principle of causality will be true always and everywhere." To adhere to classical geometry is to measure lengths, etc., in a manner suitable to the needs of the science, and the acceptance of classical mechanics implies the assertion that "It is possible to adopt once for all and for all the motions of the universe a method of reference such that the Axioms of Mechanics will be true always and everywhere," this being substantially the view of Neumann. The differ-

[4] See *Les Axioms de la Mecanique, Examen Critique,* by Paul Painlevé, 1922, in particular pp. 9, 11 and 23. Painlevé's strictures were primarily directed against the general theory of relativity, but apply with equal force to the contractions of lengths and dilations of durations of the special theory.

ence between the classical point of view and that of relativity may be well summed up by putting what we shall call the *Postulate of Painlevé* in antithesis to the *Postulates of Einstein.* Under the former name we put forth this assertion: *The conventions of measurement adopted for the primary quantities of physics, viz. lengths, durations, etc., ought to be so framed that these attributes preserve constancy in value when there is a change in place, a change in time, or a change from one coordinate system to another.* This voices among other things our determination to adhere to the law of free mobility. It is not, of course, sufficient for insuring consistency of measurement of distances along paths of motion of points in space (as contradistinguished from lengths of lines on bodies), and if this be desired it is necessary to add a clause recognizing certain particular reference systems as alone admissible in physical science. Science must choose then between the Postulate of Painlevé and the Postulates of Einstein; the latter is not compatible with the former, and sacrifices consistency in measurement to covariance in equations.

Relativists, of course, take the ground that their postulates and the conventions of measurement required to justify them are not the result of an arbitrary fiat but flow naturally and inevitably from the observation of nature. And it is hardly necessary to say that they are particularly prone to make use of the Michelson-Morley experiment as an argument. Dr. Carus, commenting on this remarked: "What this famous experiment has to do with the principle of relativity except in a most general way is not yet clear to those who have not joined the ranks of the relativity physicists; but the relativity physicists insist very vigorously and dogmatically that it proves or at least favors

their theory."[5] The Relativists bring the Michelson-Morley experiment into play as upholding their special postulate, but in point of fact the failure to detect an "ether drift" by this experiment has no logical connection whatever with the special relativity theory. For the experiment was carried out on the earth, and the earth as reference body is *not* Galileian, and thus has no concern with the special theory. If indeed it could be shown that an ether drift was never to be found with a certain Galileian reference body this would have a bearing on the doctrine that the speed of light is invariably 186000 miles per second, no matter what Galileian coordinate system it be measured under. But to base this conclusion on the behavior of a non-Galileian reference body is what is known in logic as an *ignoratio elenchi.* This being the case we need not stress the fact that transmission of light on the earth's surface is not through a vacuum and does not take place in the absence of gravitation. Nor need we point out that the failure to observe an anticipated ether drift in an experiment can be given various interpretations. Indeed Dr. L. Silberstein remarked that what we have learned from the Michelson-Morley experiment "stripped from every theoretical interpretation" is merely as follows: "Let O, A, B, be three points marked on a slab of stone. Then whatever the phase-difference or time-lag between the light signalling OAAO and OBBO in one orientation of the slab, it remains the same under any other orientation say, after turning the slab by 90° relatively to the Earth, that is, and no matter at what season of the year."[6]

[5] *The Principle of Relativity,* Chicago, The Open Court Pub. Co., 1913, p. 68.

[6] *Phil. Mag.,* 1924, v. 48, p. 397. Moreover Miller (*Science,* 1926, v. 63, p. 434) has pointed out that the nonchalent assumption of the Relativists that the Michelson-Morley experiment gave a true zero or null result, showing no difference in the light signalling under different orientations of the apparatus, is very far from the truth. The experiment has never yielded a really null result.

The basic feature of Relativist mensuration is its theory of simultaneity. And the primary idea here is that simultaneity, not merely as an occasional necessity of practice, but as a matter of principle, must, with events not in the same neighborhood, be determined by means of light signals flashed from the places where the events take place —that the very definition of simultaneity in such cases rests on the laws of the transmission of light. Relativists thus repudiate with disdain the doctrine of classical science that simultaneity of occurrences at different places is to be defined by means of clocks which, having run synchronously when together, may be taken as still synchronous when widely separated. This path to the definition of simultaneity by way of the doctrine of the constant speed of light was first pointed out by Poincaré who remarked that the postulate "that light has a constant speed and in particular that its speed is the same in all directions" could be taken as the foundation for the notion of simultaneity. Acceptance of the postulate he based on the Principle of Sufficient Reason, that is to say, because there is no sufficient reason why any particular direction should possess particular advantages for the propagation of light, we may legitimately hold that all directions are alike in this respect, and that in all of them light has the like speed. This postulate he asserted was one without which no measurement of the speed of light could be even attempted. Yet in point of fact it is quite obvious that measurement of the speed of light could readily be made under the assumption that the speed of light was not constant provided some definite law was laid down fixing the relation of its speed in one direction (or under one set of circumstances) to its speed in every other. And if certain observations could

The fact is simply that such an "ether drift" as might be anticipated *under the assumption that the ether was stationary as regards the sun or the fixed stars* did not make itself manifest.

be interpreted either as a variation in the speed of light or a variation of lengths and of durations under the influence of mere change in time, in place or in reference system, then a physicist who adhered to the Postulate of Painlevé would accept the former alternative.

Relativists however take the reverse point of view and begin by considering a Galileian reference system in which the "postulate of the constant velocity of light" is understood to hold. A body moving longitudinally in uniform translation with respect to this gives the basis for a second Galileian reference system. The latter is usually likened to a train, which when itself taken as standard of immobility is stationary, while the reference body of the other system is not unlike an embankment alongside which runs the "train" which is, of course, moving as regards this system of coordinates. At the instant the front of the train is opposite a point A on the embankment a flash of light is sent thence rearward, and at the instant the rear is opposite a point B a flash is sent from here forward. And the question is posed whether or not the passage of A by the front and that of B by the rear of the train are simultaneous events. This question is considered as equivalent to that as to whether the two flashes do or do not simultaneously reach an observer midway between their origins. Now there might be two such observers, one in the middle of the train, the other on an embankment, halfway between A and B. If then the light signals reach the embankment-observer simultaneously it follows that they could not reach the train-observer simultaneously, for he is moving to meet the flash emitted from the front while moving away from the flash which is striving to overtake him from the rear; hence the latter will reach him later than the former. This, to be sure, is merely an argument

ad hominem, for it is based on the classical view that the motion of an observer towards or away from a source of light makes a difference in the time it takes this light to reach him, a view repudiated by the Relativists themselves who regard each observer as making use of a reference system under which he himself is stationary and under which light coming to him has always, as regards this system, the constant speed of c miles per second. The argument takes the ground that as regards the embankment-observer the light flashes have *ex hypothesi* this speed (since it has been stipulated that the "postulate of the constant velocity of light" holds as regards the embankment coordinate system) but do not have it as regards the train-observer. But under the special theory of relativity the light flashes would have the self-same speed for both observers, and ought to reach both simultaneously. The Relativists contend that they have here demonstrated the relativity of simultaneity and have shown that we should never speak of two events as simultaneous in an absolute sense but only as simultaneous when a given reference system is in view. But in truth the conclusion thus drawn is based on premisses taken from two conflicting theories: the Relativist doctrine that simultaneity must be defined by means of light signals, and the classical doctrine regarding the effect produced by motion of an observer towards or away from a source of light. None the less the Relativists with arguments such as that just outlined, deem that they have overthrown the time-honored theory of chronometry, and justified their demands for the acceptance of the two postulates of the special theory. From the doctrine of relativity of simultaneity they proceed to that of relativity of lengths and durations, and contend that when change is made from a Galileian reference system in which a rod is stationary to one in which it is

moving longitudinally, its length contracts and that there is an analogous dilation of durations, the duration of any event taking place on one Galileian reference body and measured in the first instance as regards this, measuring up as a longer interval of time when considered from the point of view of another Galileian reference body moving relatively to the first. In the case of the rod the ordinary method of measuring by direct application of a measuring stick is accepted as satisfactory in the first reference system, but with the second it is contended that the measuring stick must be applied to something stationary as regards the new reference system. That is, two points are determined on the "embankment" of the second system which are simultaneously opposite the front and rear respectively of the rod. And the length measured between these two points is declared to be what we must take as the length of the rod, so that if simultaneity is relative, length may may well be so deemed. This declaration however rests only on the *ipse dixit* of the Relativist. And science can—if it accepts the Postulate of Painlevé *will*—continue to regard the length as, in principle at least, determined by direct measurement, notwithstanding the change to a new standard of immobility under which both the body measured and the measuring stick are alike in motion.

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NOTES AND NEWS

ARISTOTELIAN LOGIC AND THE LOGIC OF CLASSES

A Reply to Professor Northrop

PROFESSOR NORTHROP, in a recent article on "An Internal Inconsistency in Aristotelian Logic,"[1] tries to show that "there is a fundamental contradiction in Aristotelian logic which is escaped in the logic of classes." This statement seems to me to be ambiguous. For it is not clear what is meant by Aristotelian logic as *opposed* to the logic of classes. The traditional logic has been intimately connected with the operation of classification. And the fact that it has been applied to classes is evident from the diagrams of the text-books of logic representing the inclusion and exclusion of classes.

As a matter of fact the symbols and forms of Aristotelian logic have been interpreted in different ways by different schools of philosophy and it is to a great extent a question of arbitrary convention which interpretation is to be taken as fundamental. There is, no doubt, an important characteristic of the modern logic of classes which may be conveniently taken as distinguishing it from other types of logic. What I mean is the point of view of *extension*.

If it is granted that the point of view of extension is constitutive of the logic of classes and if the logic of classes is defined as being *opposed* to other types of logic then these other types may be qualified as *the logic of intension*. This opposition between the logic of intension and the logic of extension might represent Mr. Northrop's opposition between Aristotelian logic and the logic of classes. And there certainly are passages in Mr. Northrop's article which suggest that this is what he means by the opposition in question.

But if that were what Mr. Northrop meant, the main reason for his attack on Aristotelian logic cannot be maintained. For this reason lies in the assumption that the Aristotelian universal proposition always implies existence of the subject of the proposition. Now it is hardly necessary to remind ourselves again that whether

[1] *The Monist*, Vol. XXXVIII, No. 2, 1928.

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or not the universal proposition implies existence is a matter of conventional interpretation. But if it is granted that the universal proposition implies existence, then *this interpretation is not in intension but in extension.* For intension is concerned with the characters and their relationships and ignores the substantival bearer of the characters, whereas extension is at one with existence in that both deal with substantives. Hence if Mr. Northrop argues that the Aristotelian universal proposition implies existence he cannot consistently hold that Aristotelian logic is exclusively intensional.

However, I am not going to press this point. The above considerations are presented in view of suggesting an interpretation of Aristotelian logic, which interpretation will come out of the analysis of Mr. Northrop's argument. The main purpose of this paper is to show that Mr. Northrop's argument is invalid even if it is granted that the Aristotelian universal proposition implies existence.

The argument of Mr. Northrop, briefly stated, is as follows. The Aristotelian universal proposition (1) "All S is P" is consistent with (15) "All non-S is P." Yet the first proposition implies that (5) "Some non-S is non-P" (the converse of the contrapositive of (1), which is contradictory to (15).[2]

"Since by one set of rules propositions 1 and 15 are consistent and by another equally acceptable set of rules they are contradictory, the conclusion is inescapable that Aristotelian logic is an internally inconsistent system."

But this argument apparently overlooks that propositions 1 and 15 *cease to be consistent* when it is found that they are contradictory. Aristotelian logic would be inconsistent only if it maintained that propositions 1 and 15 *continue* to be consistent even after it is shown that they are contradictory. But that has never been claimed. At least there is nothing in the meaning of consistency which would necessitate for Aristotelian logic such an inconsistency.

When, in the beginning of the argument, it is stated that propositions 1 and 15 are consistent it should not be claimed that they *are* both true. If two propositions are consistent it means that they *may* be true unless some additional information undermines this possibility. And, of course, if such additional information is secured the propositions cease to be consistent. Nevertheless, *relatively* to the old data they are still consistent.

[2] The numbering of these propositions is that of Mr. Northrop.

The point is that *consistency is relative to the information at hand.* If this information became absolute there would be no consistency, because everything would be established as either true or false and possibility of truth would be redundant. On the other hand, it is plain that consistency may be cancelled provided really new information is supplied to that effect.

Keeping in mind these considerations one is justified in saying that the propositions 1 and 15 may cease to be consistent provided really new information is added to proposition 1 by inferring proposition 5. Since proposition 5 is inferred according to the rules of immediate inference the question turns upon the significance of immediate inference. It may be assumed, however, without entering into discussion, that Aristotelian logic takes immediate inference to be a real inference, i. e. the deduction of really new information. And this being granted there is no inconsistency in claiming that due to the new information of the inferred proposition 5 the original propositions 1 and 15 cease to be consistent.

But at this point a doubt may arise. How about the cases when propositions 1 and 15 are not only consistent but in fact both true? The answer is that this is possible only in one case which amounts to the impossibility of drawing the immediate inferences in question from the original proposition 1. The case is this. If "All S is P" and "All non-S is P" are both true, then P is equivalent to "S + non-S." Therefore, according to the Principle of Excluded Middle P is equivalent to the Universe of Discourse. That is to say, there is no non-P, for if there were a non-P, it would fall outside of the Universe of Discourse. In terms of intension non-P would be then unmeaning and impossible. Hence all the implications of proposition 1 which involve non-P are ruled out as invalid. Proposition 5 which is one of them is accordingly impossible.

And it is impossible because of the additional information given by proposition 15, provided the latter is true. In other words proposition 15 amounts to the explicit denial of non-P. It is not the case that non-P is declared to be an empty class (though this interpretation is quite legitimate from the point of view of the logic of classes). It is simply an absolute exclusion of non-P regardless of whether the latter is a class or a substantive or what not. There is nothing inconsistent in such an exclusion, nothing which would necessitate an appeal to the empty class.

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I emphasize this point because Mr. Northrop insists that only empty classes could save Aristotelian logic. I think on the other hand that too much honour is given to empty classes!

It seems to me that Aristotelian logic is entirely workable on the assumption that *there are* S and non-S and P and non-P *unless the absence of any of these is explicitly specified in a particular instance.* This assumption presents a *universal* pattern of possible relationships of the two terms of a given proposition. The fact that these two terms and their contradictories *are* does not mean necessarily that they exist or subsist or have any other specific mode of being. But, of course, conventionally any of the modes of being may be attributed to the propositional terms. Consequently one may assume that S, non-S, P and non-P exist.

Yet even if existence is assumed, it is assumed as a general rule or in intension. And exceptions are admitted in *application* of the rule to particular instances. Only these exceptions must be explicitly stated. And then the reasoning may proceed along the general lines with the corrections due to the stated exceptions of the case.

These exceptions are numerous and various. For it depends on the particular instance which term or combination of terms are lacking. In the case discussed above P monopolized both S and non-S to the exclusion of non-P. The most interesting case seems to be that of the universe of discourse which monopolizes all possible terms. Hence it cannot be treated as one among other terms,—which involves certain difficulties and, perhaps, something like Russell's theory of types. But this remark lies off the present track. What I want to point out is that there are many peculiarities in the particular instances and, consequently, a general logical scheme must be abstracted of all of them in order to avoid particularising.

This abstraction may be secured in two different ways. Either —as the logic of classes does—a possibility is left that any of the classes operated upon may be null. Or—as Aristotelian logic assumes—all the propositional terms are significant unless otherwise specified, and since this specification depends entirely on the nature of the particular case no ambiguity can arise in applying the general scheme to determinate particular instances.

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A REPLY, EMPHASIZING THE EXISTENTIAL IMPORT OF PROPOSITIONS

MR. UCHENKO'S criticism of my article involves two points. The first, which he does not press, he summarizes as follows: "If Mr. Northrop argues that the Aristotelian universal proposition implies existence he cannot consistently hold that Aristotelian logic is exclusively intensional." To this the reply is that I do not maintain the latter thesis. The distinction between these two systems of logic which is relevant to my argument is that the logic of classes admits the possibility of the emptiness of the class referred to in the subject of the universal, whereas the traditional logic does not, while both maintain that particular propositions imply existence. This was indicated in the graphs.[1] That such is a fair description of Aristotelian logic, as usually taught, is evidenced by its acceptance of the two principles, that affirmative propositions can be converted, and that the universal implies the particular. The former principle is invalid if Aristotelian logic is regarded as purely intensional; the latter, if assuming some extensionality, the subject-term of the universal does not imply existence.

His second point is that my argument "overlooks that propositions 1 and 15 cease to be consistent when it is found that they are contradictory." "The point," he says, in another paragraph, "is that consistency is relative to the information at hand." My difficulty with reference to this contention is that I find it impossible to understand what temporal distinctions and material information have to do with the consequences which the laws of formal implication designate with reference to a proposition when no additional proposition containing new information is introduced. The point is not that the accepted formal principles of Aristotelian logic designate proposition 1 as consistent with proposition 15 when the former is considered alone, and contradictory when it is considered in connection with some other proposition containing additional in-

[1] *The Monist*, Vol. XXXVIII, No. 2, pp. 198-201.

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formation, but that they make proposition 1, when considered alone, both consistent with, and the contradictory of proposition 15, at the same time. Both consequences are the result of purely formal principles.

If Mr. Uchenko means, as his designation of immediate inference as "real inference" suggests, that the new information of which he speaks is supplied by the purely formal principles of immediate inference alone, then his argument proves too much. Since the rules of immediate inference are always present, the "additional information," and the contradiction to which it gives rise, is also present upon every occasion when proposition 1 is asserted. From this it follows that his contention concerning consistency at one time, and contradiction at another, is untenable.

Throughout his paper Mr. Uchenko gives evidence of a difficulty which he experienced in determining my interpretation of the existential import of propositions. This arises from my failure to make a point emphatic in the text, which was explicitly indicated in the diagrams. My argument rests upon the assumption that the affirmative proposition in Aristotelian logic, as this science actually exhibits itself in usage, implies simply the existence of its subject. This was indicated in the graphs by the fact that section d contained neither shading nor a star. The justification for this description of Aristotelian logic as it is actually used, is that neither the formal properties of a universal proposition as they are exhibited in the distribution of its terms, nor experience with such propositions in this universe, nor our traditional text-books, warrant the conclusion that the negate of the predicate of universal propositions contains members. The latter is a possible interpretation of Aristotelian logic but it is not the one which characterizes this science as it is actually used.

In this connection, it is to be noted that my paper does not claim to establish the impossibility of giving Aristotelian logic a consistent interpretation. The thorough-going extensional view of which we have just spoken was referred to, in the original paper, as consistent. J. N. Keynes and W. E. Johnson[2] have suggested other consistent interpretations. The point is that these different possible consistent systems have, for the most part, a purely theoretical status; neither of them represents the applied Aristotelian

[2] J. N. Keynes, *Formal Logic*, Fourth Edition, 1906, pp. 223-7; W. E. Johnson, *Logic*, Vol. I, ch. IX.

logic which is supposed to direct our inferences without error in the world of experience, providing our premises are verified, and which is taught by means of the traditional introductory texts when they refer to the distribution of terms, the methods of immediate inference, and the rules of the syllogism. It is this latter system to which we refer when we use the expression "Aristotelian logic." Certainly this science has not been consistently interpreted as necessitating that one who holds that living organic systems are mechanical systems must deny the thesis that inorganic systems are mechanical systems. Traditional Aristotelian logic has never been interpreted as necessitating that a man who is a mechanist in his biological philosophy must reject mechanism in his physical philosophy. Yet such is the logical consequence of a logic which admits the method of conversion by contraposition along with the principle that the universal implies the particular, while also maintaining, in its principle concerning the convertibility of affirmative propositions, that its propositions are not purely intensional. The point is that if Aristotelian logic is to be an internally consistent system it must reject certain of the principles or implicit assumptions which are now a part of it. The result in any case would be a science quite different from the one to which we are accustomed. Furthermore, if this modification is to be in that direction which involves the slightest change, while escaping the absurdity of requiring that the assertion "All a is b" implies the denial of "All not-a is b," the result must be a denial that the universal implies existence. This is to accept the interpretation which the logic of classes uses, as that logic has been applied to ordinary propositions by Bertrand Russell and H. M. Sheffer. The principle that the universal implies the particular then becomes invalid, but in return one is able to make use of the notion of the empty class and gain the greater fertility and simplicity which such a development makes possible.

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SOME RECENT BOOKS

Geschichte der alten chinesischen Philosophie. By ALFRED FORKE. Hamburg, Kommissionsverlag L. Friederichsen & Co., 1927. xv+594. RM. 36.

Professor Forke has here set himself the high aim not merely of extending our knowledge of a genuinely significant cultural life but also of securing for Chinese philosophy, as Deussen did for the thought of India, an integral place in the general history of philosophy. The present volume sketches the beginnings of Chinese philosophy during the period from 2356 to 1122 B. C. and then presents in some detail the succeeding movements up to the close of the feudal and kingship eras and the rise of a central empire, about the end of the third century B. C. During this time the vital principle of the whole of Chinese culture, including its philosophy, had already reached forceful and elaborate expression. This philosophy of China was not anonymous, as was that of early India; it centered in strong personalities, who may be grouped into schools, somewhat as in ancient Greece. What tradition has preserved with reference to the lives and traits of these early Chinese thinkers is assembled in the present volume. By constant reference to the original sources (quoted in the original as well as in translation) the main outlines of their thought are set forth. The author's purpose, however, is not so much to enter into an investigation of dark and intricate details as to create a solid basis for the minute research of the future. Professor Forke has placed under heavy obligations philosophers, Sinologists, ethnologists and students of religion, all of whom will eagerly await his promised volume which is to carry the survey down to the present.

Philosophie der Raum—Zeit—Lehre. By HANS REICHENBACH. Berlin and Leipzig, Walter de Gruyter & Co., 1928. Pp. vi+380. M. 18.—*geb.* 20.

This development of the author's *Axiomatik der relativistischen Raum—Zeit—Lehre* (1924) is a notable contribution to the philosophy of the exact sciences and to epistemology. Its point of departure is not a particular philosophical system in terms of which it seeks to construe space and time or into which it attempts to fit present scientific doctrines. On the contrary, it has its orientation in the mathematical and physical doctrines dependent upon non-Euclidean geometry and the theory of relativity. It undertakes a critical examination and interpretation of these doctrines with the view of furthering our knowledge not alone of space and time but also of the principles and methods of knowledge. Thus it belongs to the growing body of recent literature in which philosophy, after almost exclusive preoccupation with problems and viewpoints connected with the mental disciplines, is grappling with the issues connected with the mathematical and natural sciences. In so far it is reminiscent of Leibniz and Kant, though its results are necessarily divergent from them because of the subsequent revolutions within mathematics and physics. Reichenbach, it should be added, sets for philosophy the goal of objective knowledge, built up by the contributions of individual thinkers laboring with specific problems, much as occurs in the sciences; he views with disfavor all attempts to construct independent philosophical systems representing simply the viewpoints of individual thinkers and thus mere monuments to their speculative ability.